

Articulated VPs and the computation of Aktionsart

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1.0 Introduction

In recent years, the semantic domain of aspectual verb classes (Aktionsart) has become the focus of interest of researchers working within the syntactic domain of phrase structure. The importance of syntax to the determination of verb class has been highlighted since the work of Verkuyl (1989). The importance of aspectual notions to the determination of syntactic structure has been highlighted since the work of Tenny (1994). This combined research has taken a number of different directions. It has been pointed out that the syntactic representation of arguments has to take into account aspectual notions such as telicity as well as (or, as some believe, instead of) the more traditional notion of theta-roles (see e.g. Borer 1994 and van Hout 1996). Another observation has been that structural case-marking can have an effect on the telicity of an event. Given that structural case-marking in earlier versions of the Minimalist Program involved a Spec, head relation with a functional category such as AgrO and AgrS, the translation of this observation has been that the computation of the aspectual verb class is tightly linked to the configuration of such functional categories. In another related direction of research, a link has been made between direct case-marking and specificity, and between specificity and the appearance of DPs outside of the VP. Putting all of this together, one is lead to conclude that the elements important to the computation of Aktionsart are those elements in specifier positions outside of the the verb phrase.

In this paper I explore an alternative relying heavily on two assumptions. The first assumption is that the domain of idiosyncratic lexicalization and semantic compositionality is within the VP. The second assumption in that the domain of existential closure as proposed by Diesing is the VP and that this can be tested using the word order of DPs with respect to specific adverbs. I will claim that if these two assumptions are appropriate, one can show that the computation needed to determine

aspectual verb classes must occur within the VP. I will begin the discussion in section 2 by first looking at morphologically complex words. I will claim that, in the computation of aspectual verb classes, some notion of an articulated VP is necessary. Further, I will argue that telicity¹ can be encoded in three different heads within this complex VP structure. In section 3, I will continue by looking at the position of phrasal projections within the VP and argue that elements (particularly DPs) that can be shown to be within the VP can, in fact, be used in event computation.

2.0 The computation of lexical material

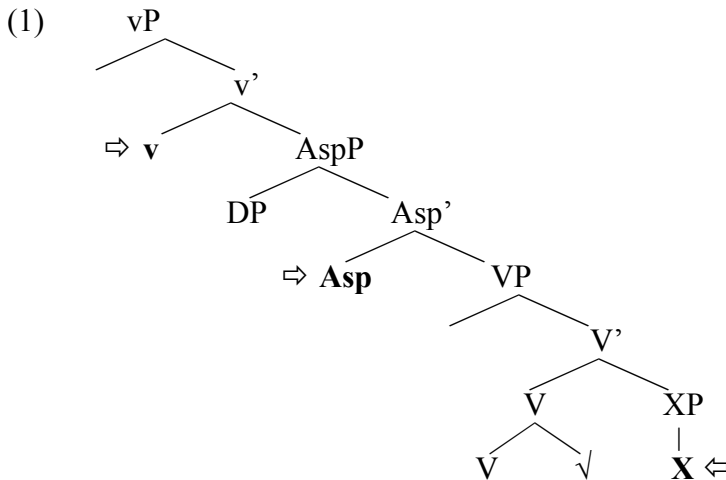
Carter (1976) discusses the question of what a possible word is. His interest is in how complex an argument structure one word can have. There is an inherent problem in such a discussion, however, because first one has to determine what counts as a word. In English, arguably the argument structure of one word cannot contain two agents so no verb can mean ‘x makes y wash z’. In a language like Malagasy, however, which has morphological causatives, the word *mampanasa* means exactly that. However, one can distinguish certain domains in which lexical type of phenomena occur, for instance a domain in which meaning is not strictly compositional. I will refer to this domain as the l-syntax domain following Hale and Keyser (1993).² Once one restricts such a domain, and in addition, one views this domain as part of syntax as I do, then we can investigate phenomena that occur within this domain using the vocabulary and mechanisms independently used in the s-syntactic domain.

I will be using the articulated VP structure given below where Asp(ect) Phrase occurs embedded within the VP, below the position of the basegenerated external argument. I will be assuming that Themes are generally generated in the Spec position of the VP, but that the element that measures the event (EM) will appear in the Spec of the Aspect Phrase.³

¹ Boundedness (see Depraetere 1995) might be a better term for some of these phenomena particularly when arbitrary endpoints are created, but I'm not yet convinced that there is a theoretically useful distinction.

² In Travis (2000), I referred to the notion of s-word (meaning either and both syntactic word and semantic word). Marantz (1997) refers to this domain as the domain of special meaning.

³ We will see later that in some languages that allow telicity to be marked in this position, Spec, Asp will have a different use.



In this paper, I will be arguing in particular that telicity can be marked in three places on this tree, as marked by the arrows above. These three places are (i) X, the head of the complement of the V, (ii) Asp, and (iii) v. I will present evidence for each of these positions in turn, and argue that they have different consequences with other elements in the tree.⁴ A table giving a brief overview is given below.

v	Asp	X
Functor category (Ritter and Rosen) - restricted class	Functional (binding category, Travis) - closed class	Lexical category - open class AP/PP
scope above Event Measuring DP (in Spec, Asp)	scope below Event Measuring DP (in Spec, Asp)	scope below Event Measuring DP (in Spec, Asp)
endpoint, beginning point, arbitrary point	endpoint, beginning point	endpoint

Going from right to left on the table we can say, just observationally, that we might expect a different inventory of elements to appear in the three positions. I am assuming that X often is realized as an A ('The children hammered the nail flat') or a P ('The children pulled the poster down'). As lexical categories⁵, we expect to have a wide range of possible elements in this position. Aspect, I assume, is a functional category⁶ and as such we might expect to find a very restricted set of elements in this position. In the

⁴ In this paper I will not be talking about the attachment of the root so I have simply adjoined it to V. However, I believe that the root can vary on where it attaches (see Erteshik-Shir and Rapoport (1997) for this type of claim).

⁵ I assume that P is a lexical category though this is not crucial in the context of this paper.

extreme there may be just the realization of plus or minus features. While Chomsky (1995) considers “little” *v* a functional category, I assume that it is a functor category along the lines of Ritter and Rosen (1993) and as such will not be as open a class as *X* or as closed a class as *Asp*.

These are just observations concerning the types of elements we might expect to appear in these positions, but the other characteristics of the different elements will be much more important in their determination. I assume that elements in *X* can only describe endpoints of events. Elements in *Asp* or *v* can pick out beginning points of events, and only elements in *v* can designate arbitrary endpoints of events.

Finally, because of their different positions with respect to the Event Measuring DP, the telicity markers will interact with the DPs differently.⁷ The markers in *v* will have scope above the DP, and the markers in *X* will have scope below the DP. I will leave aside for now the interaction with the telicity marker in *Asp* for reasons to be discussed below. Now we will turn to each of these cases.

2.1 Telicity in *X*

Arguing that the position *X* can hold material encoding the endpoint of an event is the least controversial of the claims that I will make.⁸ Many of the small clause type analyses of complex verb phrases proposed in the late 80s had an equivalent of an *X* position to describe the endpoint of an event (see for example Hoekstra 1988). A typical example from English is given below where the atelic verb *push* (2a) becomes telic when a PP is added (2b). Further we can see that the event measuring DP, if it is a bare plural (-SQA in the terminology of Verkuyl (1989)), changes the whole VP back to an atelic predicate (2c). This, I argue, shows that the telicity marker has scope below the Event Measuring DP.

⁶ In other work I claim that event related 'functional' categories such as Aspect, and Event, have a special status of what I have termed 'binding categories' because they bind event variables.

⁷ The idea of using the interpretation of telicity with respect to the Event Measuring DP comes from Slabakova's work (e.g. Slabakova 1996, 1997, 2001).

⁸ This position for the marking of telicity is similar to, among others, Snyder (1995).

- (2) a. *push DP_{sg}*—atelic
The children pushed the cart (*in three minutes/√for three minutes)
b. *push DP_{sg} PP*—telic
The children pushed the cart to the wall (√in three minutes/*for three minutes)
c. *push DP_{barepl} PP*—atelic

2.2 Telicity in v

Slabakova (1997, 2001, 1997) has argued that in Bulgarian (and other Slavic languages) the marking of telicity as done by preverbs is higher than it is in English. In Slabakova (1997, 1997), she claims that these preverbs appear in v. She gives two arguments for this, one is that preverbs can also encode a causative meaning as might be expected in v, and the second is that these preverbs have scope over the Event Measuring DP. Relevant examples for each argument are given below. In (3) we see the preverb *raz-* which adds an agent to the root verb. In (4) we see that the preverb has scope over the DP since it creates a telic event in spite of the [-SQA] quality of the DP.

(3) *raz-* adds an agent (Slabakova 1997: 89)

- a. Kounòt *raz-smja/raz-plaka* bebeto
clown-DET PV-laugh/cry-3sS/AORIST baby-DET
'The clown laughed/cried the baby.'
- b. Kompanijata na drugi dexo vinagi *raz-jazda* decata
company of other children always PV-eat 3pS/PRES children-DET
'The company of other children always gives children an appetite.'

(4) Toj na-pis-a pisma *3 casa/za 3 casa (Slabakova 2001: pg 89)⁹
he PV-write-3SG/AOR letters *for 3 hours/in 3 hours
'He wrote letters in 3 hours.'

I would like to claim further, that from the position of v, telicity can target a variety of points in an event. It can specify not only the natural endpoint as can an element in X, but it can also target the initial point and an arbitrary endpoint. Examples below show all of these possibilities. In (5) we see again the case of Bulgarian preverb *na-* added to the imperfective root to give a telic predicate. When the same preverb is added to the stative predicate *mráz* 'hate' in Bulgarian as in (6), a beginning point is created. Finally,

⁹ Slabakova (1997) places Bulgarian preverbs in v and it is this analysis that I am following. In Slabakova (2001), she changes the analysis and places the preverbs in a Perf head between v and Asp.

Kozłowska-Macgregor (2002) shows that the preverb *po-* in Polish, shown here in one of its uses in (7), creates an arbitrary endpoint.¹⁰

- (5) na-pis-a (endpoint)
 PV-write-1SG
 ‘to write up’
- (6) na-mraz-ja (beginning point)
 PV-hate-1SG
 ‘to start hating someone’
- (7) Maria po-czyta-la książkę
 Maria **po**-read-past book
 ‘Maria read a book for a while’

2.3 Telicity in X and v

We have already seen, then, that telicity can be marked in two different places. We have used English and Chinese to look at marking in X and Bulgarian (and Polish) to look at marking in v. A given language may employ more than one of these, however, and to see this we turn to the Athabaskan languages of Navajo and Slave.

Navajo is well-known for its complicated and recalcitrant verbal morphology. The easiest way to present this morphology is through a templatic description such as the one from Speas (1990) given below.

¹⁰ We could say that an arbitrary endpoint is also created in (4) above since the object is not [+SQA].

(8) Navajo Verbal Morpheme Order (from Speas (1990:205))

ADV ITER DIST-PL D-OBJ DEIC-SBJ **ADV** MODE SBJ VOICE/TRNS STEM

1 2 3 4 5 **6** 7 8 **9**

1= ADVERBIAL: manner, direction ... also indirect object pronoun

2= ITERATIVE: aspectual/adverbial prefix

3= DISTRIBUTIVE PLURAL: plural and distributive, 'each one separately'

4= DIRECT OBJECT: number and person of direct object

5= DEICTIC SUBJECT: indefinite (someone) or fourth person (people in general)

6= ADVERBIAL: adverbial/aspectual notions

7= MODE: core of tense system

8= SUBJECT: person and number of subject

9= VOICE/TRNS

The positions that we will be most interested in are the ones in bold — positions 1, 6, and 9. As Speas points out, some lexical items appear to be 'a sort of discontinuous morpheme'. The examples she gives of this are reproduced below with information as to which slot in the template the morphemes appear. To take the most complicated one, we can see that what might be the lexical entry for the verb 'to pray' is in fact a combination of discontinuous morphemes spread over positions 1, 6 and 9.

- | | | | | | |
|---|----|-------------------|---------------------|-------------|----------|
|) | a. | yá ... ti' | 'to talk' | 1 ... | stem (9) |
| | b. | di ... lid | 'to burn something' | 6 ... | stem (9) |
| | c. | so ... di ... zin | 'to pray' | 1 ... 6 ... | stem (9) |

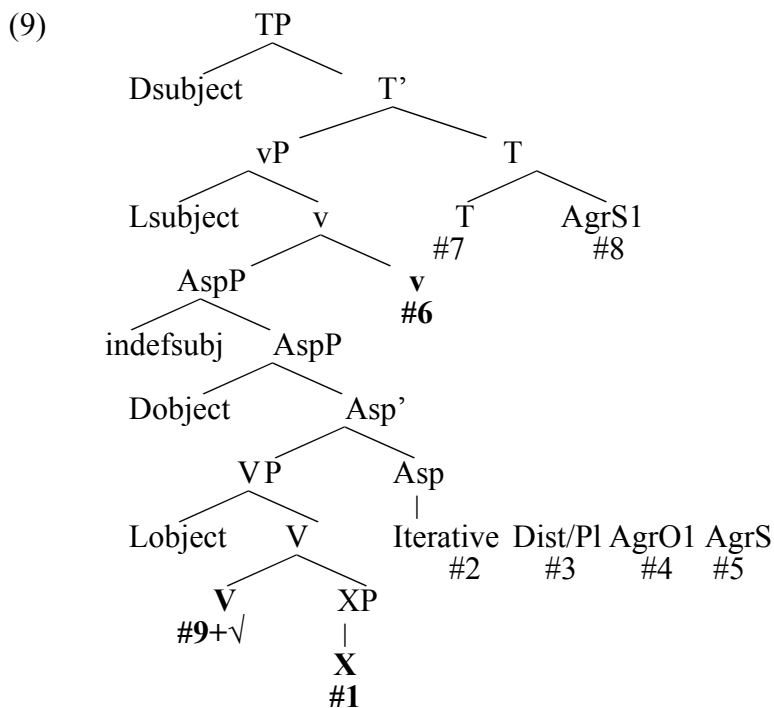
I would like to suggest that these three positions represent the three non-functional heads that appear in the articulated VP structure sketched in) — v, V ($\sqrt{\quad}$) and X. Because of a slight complication of morphology, the mapping of morpheme to structure is not completely straightforward but I am assuming that position 1 is X, position 6 is v, and position 9 is V ($\sqrt{\quad}$).

The morpheme order in Navajo seems to be the opposite of what one might expect given the Mirror Principle of Baker (1985). While positions 1 through 8 might

look predictable with the syntactic level going up from left to right ending with subject agreement, it is surprising to have the verb stem at the end (position 9) rather than at the beginning. While there have been a variety of accounts for this morpheme order (see e.g. Speas 1990, 1991), I assume in Travis (1992) that there is a sort of morphological tucking in. In other words, each morpheme as it is added is attached to the verb stem rather than to an edge. This has the affect of pushing already attached morpheme further to the left in the structure. This is shown schematically below.

-) a. [MW]
- b. af1 + [MW]
- c. af1 + af2 + [MW]

Further, I assume that the morphemes can pile up in heads on the type of tree that was introduced above. A sketch of this is given in). While a discussion of the details of this analysis would take me beyond the line of argumentation of this paper, the important point to notice is that position 9 is the V plus $\sqrt{\quad}$, position 1 is X, and position 6 is v.



This type of analysis of the positions, in fact, correlates closely with a recent analysis by Rice (2000) of similar morphemes in the related language, Slave. She argues that the morpheme order in Slave correlates to their syntactic scope. As a part of her discussion, she investigates a set of morphemes that she calls situation aspect markers, and a set of morphemes that she calls subsituation aspect markers. In lining these up with the Navajo morphemes, the subsituation markers appear in position 1 and the situation markers in position 6. This also correlates with the use of these morphemes — those in position 1 (which is X) can only see part of the situation, the endpoint, while those in position 6 (which is v) see the whole situation. Slave and Navajo, then, are cases where elements in both v and X can be used to create the construction of an event.

The question can then arise as to the role played by DPs in such a language. Both Smith (1991) and Rice (2000) pick up this question in Navajo and Slave respectively, both coming to the same conclusion which is the DPs do not enter into the computation of aktionsart in these two languages. This is, in fact, not surprising if these two languages are polysynthetic in the sense of Baker (1996). As polysynthetic languages, they would not have their DPs in argument positions but rather in adjunct positions. Rice (2000: page 271), however, points out an intriguing fact which is that when pronominal elements are incorporated into the verbal morphological system, then they can have an effect on the argument structure.¹¹

- (10) a. be-w-i-h-xi
 ‘I killed it/him/her/it’ (s accomplishment situation aspect)
- b. ku-y-i-gho
 ‘I killed them’ (gh activity situation aspect)

¹¹ What is interesting in the data below is that the plural pronominal material acts as if it is [-SQA] unlike what might be assumed to be the English correlate *them*.

2.3 Telicity in Asp

Now that we have seen two types of telicity markers, I will concentrate on a third type — the one that appears in the Aspect Phrase that appears internal to the VP.¹² I will look at Malagasy in particular but I believe that it can be argued that Chinese and English also can have telicity marked in this position, albeit covertly (see Travis 2002).

First, in looking at aspectual verb classes in Malagasy, we have to note that Malagasy is what might be called an atelic language. I take this to mean that, in the most frequently used verb forms, there is no commitment made to the completion of the described event even though the conversational implicature is that the event has been completed. So, upon hearing the sentence in (11a) the hearer will assume that the teachers have, in fact, gathered the children. The implicature can be cancelled, however, as shown by (11b).

- (11) a. namory ny ankizy ny mpampianatra (n+an+√vory)
 PST.an.meet the children the people
 ‘The teachers gathered the children’
- b. ... nefa tsy nanana fotoana izy
 but NEG PST.have time they
 ‘... but they didn’t have time.’

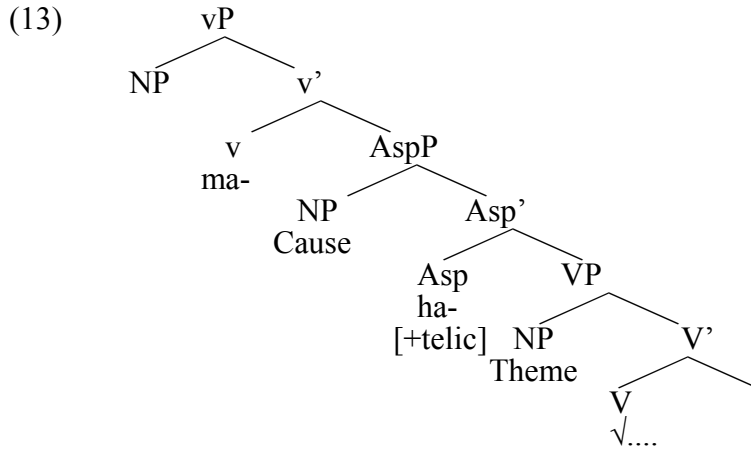
In order to ensure completion, another verbal form is used as shown in (12) below.

- (12) a. **nahavory** ny ankizy ny mpampianatra (n+a+ha+√vory)
 PST.a.ha.meet the children the teachers
 ‘The teachers gathered the children.’
- b. * nefa tsy nanana fotoana izy
 ‘.... but they didn’t have time.’

Following Phillips (1996, 2000), I assume that the verbal morphology that ensures telicity is complex consisting of a stative morpheme occurring in *v*, and a telicity morpheme occurring in the inner aspect position of Asp. As expected, there are not a large number of different elements that can appear in this position. In fact, most likely, *ha-* is the only

¹² I believe that there is also an Aspect Phrase (outer Aspect, viewpoint aspect) that occurs outside of the VP.

telic morpheme in Malagasy. Further I follow Phillips in assuming that the external argument in these constructions appears in the Spec, Asp position.¹³



It is clear that *maha-*, when added to events which describe a natural endpoint, that the telicity marker insists that it is the endpoint of the event that has been achieved. When added to activities, however, the telicity marker must refer to the beginning point as shown in the example below. The example in (14a) works as the examples we have seen before where the implicature is that the children danced but this is defeasible. In the (14b), however, it has to mean that the children, in fact, danced.

- (14) a. nandihy ny ankizy
 PST-v-dance the children
 ‘The children danced.’
- b. nahadihy ny ankizy
 PST-aha-dance the children
 ‘The children were able to (**begin**) to dance’

This morpheme, then, can in some sense ‘see’ the natural endpoint of the event if it has one, and otherwise the beginning point of an event.

Determining the predictions of the effect of this morpheme is less straightforward than the other two positions and I leave some of this work for future research. Part of the problem is that the languages that arguably make use of this position also have DPs

¹³ Chen (1995) argues that a similar effect occurs in Chinese, and I have given support from morpheme deletion in Tagalog (Travis 2000, 2001) that the non-agentive external argument has to appear in a position lower than Spec, vP.

where the value of SQA is difficult to determine. A further problem is that the use of this position seems to have other effects on the structure which interfere with the usual tests for event measurement. First, the Malagasy structure co-occurs with a stative marker and secondly, the element in the Spec, Asp appears to be the internal argument rather than the external argument. Investigating these issues is the next step in this research.

To summarize this section, we have seen that morphology that is needed in the computation of the situation aspect of an event can appear in three different positions within an articulated VP. Each of these positions has its own characteristics. The X position describes the endpoint of an event and often shows the range typical to lexical categories. The Asp position, as a non-lexical category, is closed class of perhaps only two and simply encodes whether a designated point in the event has been achieved. For events with natural endpoints (what would be translated as an accomplishment in English), it is this endpoint that is specified. Events without natural endpoints (activities), the designated point will be the initial point. Telicity markers in v as functor verbs will have a restricted set of elements and will be able to target endpoints and beginning points of events as well as creating an arbitrary bound. I argue that all of these elements occur within the VP as they are part of l-syntax and lexical learning.

3.0 The computation of phrasal material

In this section, I argue that not only morphological material within the verbal complex is important in the determination of aspectual verb classes, but also that the phrasal elements within the VP are part of event composition. I will look at this with respect to the phrases that appear in the XP position and the Event Measuring DPs.

3.1 *The contribution of XP*

It is well-known that the material in XP has to be taken into account when computing the event type of the VP. We have already seen in (2) that the presence or absence of a PP or AP can determine whether the event is an activity or an accomplishment. We have to further know the type of PP or AP and even the type of object the PP has. Some relevant examples are given below.

- (15) a. The children pushed the cart toward the wall for two minutes. (atelic)
 b. The children pulled the taffy longer for five minutes. (atelic)
 c. The children pushed the carriage into walls for five hours. (atelic)

Example (15a) shows that a directional P that itself does not have a natural endpoint will not create an endpoint for the event. (15b) shows that same thing for a resultative AP. Finally, (15c) shows that a goal PP with a bare plural endpoint acts similarly to a bare plural object. It seems logical that the elements that enter into the event composition can contribute in a similar manner. Further, it is clear that these elements must be arguments (see Hoekstra and Mulder 1990) and are arguably in the VP.

Now I will look at the contribution of VP internal DPs. For this I turn to German which was the language used in some of the original research on object movement and its correlation with interpretation. The task is to show that DPs that do not move out of the VP, at s-structure or at LF, still can affect the interpretation of the event structure of the verb.

The aim, then, is to have a DP that is interpreted within the VP and show that this DP can measure an event. I will be looking at indefinites but because indefinites are ambiguous between the quantificational reading (i.e. interpreted in the restrictive clause) and the existential reading (interpreted in the nuclear scope), we have to be careful to control for the two uses. One of the tests that Diesing uses to determine whether a DP remains within the VP or not involves extraction. The idea is that extraction out of a DP which has moved out of the VP will violate the CED of Huang (1982). In Kratzer (1996: 133), the type of extraction that is used is quantifier split. The data below show that a quantifier can be split from a subject NP that is arguably still within the VP as in (16) and that it cannot be split from a subject DP that is not within the VP as in (17).¹⁴

¹⁴ The point of Kratzer's paper is that the subjects of individual level predicates such as *wissen* 'know' are external to the VP.

- (16) a. ... weil uns viele Lehrer geholfen haben
 since us many teachers helped have
 ' ... since many teachers helped us.'
- b. Lehrer haben uns viele geholfen
 teachers have us many helped
 'As for teachers, many of them helped us.'
- (17) a. ... weil das viele Lehrer wissen
 since us many teachers know
 ' ... since many teachers know this.'
- b. *Lehrer haben das viele wissen
 teachers have us many helped
 'As for teachers, many of them know this.'

This is one of the tests I will use. Further, Diesing () argues that certain verbs — verbs of creation — do not let their objects undergo scrambling in German and therefore the indefinites will be restricted in interpretation, i.e. they do not allow the quantificational reading of their objects. She uses a variety of tests to show this. Her examples are given below.

- (18) a. I usually write a book about slugs.
 b. * I usually write any book about slugs.
 c. * I usually write the answers that you do.
 d. dass Otto immer Bücher über Wombats immer schreibt.
 e. * dass Otto Bücher über Wombats immer schreibt.

(18a) is an example of a sentence with a creation verb. (18b) shows that the quantificational use of any is not possible. (18c) shows that ACD structures are not possible with the indefinite object of a verb of creation. (18d) and (18e) show that scrambling is not possible in German with a verb from this class. Diesing's conclusion is that indefinite objects with verbs of creation can only be interpreted VP internally.

In (19) below, I show a construction where a creation verb takes a [+SQA] object DP that has undergone quantifier split. If Diesing is right in her conclusions, because the DP occurs with a verb of creation, the DP must remain within the VP. Further, because of the quantifier split, we have an additional reason to believe that the DP is within the

VP. We can see, however, that this DP is capable of measuring the event as this event can be modified by the duration phrase *in nur einer Woche* 'in only one week'.

- (19) [Artikel]_i habe ich einmal [einen]_i in nur einer Woche geschrieben
 article have I once one in only one week written
 'Once I wrote an article in only one week.'

I am assuming that constructions such as these argue that VP internal material is capable of entering into the computation of aspectual verb classes.

4.0 Conclusion

The aim of this paper was to investigate that possibility that VP internal elements contribute to the determination of the event structure of a construction. Part of the goal is to show that there is a need for an articulated VP structure. This line of research follows closely the research of Hale and Keyser 1993) in suggesting that there is a rich syntactic system that interacts closely with the lexicon. Within this syntax, there are not only lexical heads. There are also non-lexical heads that are interspersed between the lexical heads. This gives the effect that lexical items can be spread across other material as in Navajo and Slave. There are also maximal projections that remain within the nuclear scope of the construction and yet still form part of the computation of the situation aspect.

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