

EVENT ORIENTATED ADNOMINALS AND COMPOSITIONALITY*

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1 Introduction

When a noun is modified by an adnominal, as in *blue door*, *short giraffe*, or *book on the table*, the modifier is often analyzed as applying to an argument of the predicate that the noun denotes. We call this argument the *referential argument* of the noun (Williams 1981, Higginbotham 1985). Consider for instance (1).

- (1) a. $[[\text{blue door}]] = \lambda x. \mathbf{door}(x) \wedge x \text{ is blue}$
b. $[[\text{short giraffe}]] = \lambda x. \mathbf{giraffe}(x) \wedge x \text{ is short (relative to giraffes)}$
c. $[[\text{book on the table}]] = \lambda x. \mathbf{book}(x) \wedge x \text{ is on the table}$

After the noun predicate gets saturated, its referential argument is used for deriving the reference of the whole noun phrase. If we refer to something as *this blue door*, then the thing that is claimed to be blue is the reference of the noun phrase. In the same way, *this short giraffe* refers to something that is short and *this book on the table* to something on the table.

However, as pointed out in Bolinger (1967) and Larson (1998), there are also cases where the modifier does not seem to apply to the referential argument of the noun, but to an associated activity:

- (2) a. this hard worker (someone who works hard)
b. this beautiful dancer (someone who dances beautifully)

Larson proposed an analysis of such examples that extends the verbal event argument of Davidson (1967) to nouns. This allows certain nouns to have an additional event argument, to which a modifier like *hard* can then apply, as shown in (3).

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- (3) a. $[[\text{worker}]]$ = $\lambda x.\lambda e.x$ is the agent of a working event e
 b. $[[\text{hard worker}]]$ = $\lambda x.\lambda e.x$ is the agent of an event e of hard working

This postulation of an event argument elegantly accounts for the possibility of event-orientated adnominals and for their close relation with the corresponding adverbial modification.

Nevertheless, we argue that there is a fundamental problem with this proposal that undermines the compositional semantics of the noun phrase. In Larson's proposal it remains a mystery why the noun phrases in (2) allow event modification but can not *refer* to events. We show how Larson's proposal can be formulated in a more constrained way. We base our proposal on the assumption, justified by the general behavior of modification across categories, that only referential arguments can be modified by intersective adjuncts. Accordingly, we assume that there is at most one referential argument at every level of the compositional process, for both verb phrases and noun phrases. The event argument of a noun like *worker* is located at a lower level of the structure, where *hard* can apply within the scope of the derivational *-er* suffix. We show that this proposal leads to some desired predictions regarding the distribution of event orientated modification.

Our paper is structured in the following way. After an elaboration on referential arguments (Section 2), we discuss the phenomenon of event orientated adnominals, Larson's analysis of it, and the problems it faces (Section 3). Our own analysis is laid out in Section 4. Section 5 concludes the paper.

2 Referential arguments

The linguistic notion of *argument* has a semantic and a syntactic side. To see that, consider the sentences in (4). In the traditional, non-Davidsonian, analysis, the transitive verbs *surprise* and *eat* denote functions of type $(e, (e, t))$. The underlined noun phrases are at the same time semantic arguments and syntactic arguments. They are semantic arguments because they correspond to an e of the verbs' semantic $(e, (e, t))$ type. Thus, such arguments saturate a thematic role of the verb. They are syntactic arguments because they can or must be overtly realized as subject or object.

- (4) a. John surprised us.
 b. John ate (it).

We refer to this type of arguments as *thematic* arguments. These arguments differ from *expletive* arguments (e.g. '*it* rained'), which are syntactic (i.e. morpho-syntactically overt), but not semantic, because they do not saturate a thematic role of the verb. What we referred to as *referential* arguments in the introduction can now be described more precisely as those arguments that are only semantic and not syntactic. The single argument of the noun *giraffe* (type (e, t)) is not saturated by any syntactic argument of the noun, but bound by the determiner of the noun phrase (Higginbotham 1985), or by a closure operator like existential closure or another operator involving kinds, genericity, or intensionality (see e.g. Lewis 1975, Carlson 1978, Kamp 1981, Heim 1982, Diesing 1992, Krifka and Gerstner-Link 1993, Carlson and Pelletier 1995, Chierchia 1998, and many others).

The notion of referential argument that we use here is quite general and is assumed in the literature in various theoretical frameworks for different categories. Most importantly for our purposes, as explicitly stated in Higginbotham (1985), the commonly assumed referential argument

of the verb is Davidson's event argument. As illustrated in (5), this argument is not syntactic, is target for modification, and may be bound by an existential closure over events, as shown in (5b).

- (5) a. $[[\text{sing}]] = \lambda x. \lambda e. \mathbf{sing}(x, e)$
 b. $[[\text{John sang loudly}]] = \exists e. \mathbf{sing}(\mathbf{john}, e) \wedge e \text{ is loud (for singing)}$

These assumptions about the verbal event argument are pleasingly parallel with the standard analysis of nominal modification, as illustrated above in (1). However, it is not always clear how to make all the desired features of this analysis fall out from the way the combinatorial system works. The reason is that unlike simple nouns, verbs also have non-referential, thematic arguments. Furthermore, also nouns may have more than one argument. The workings of modification have to be adjusted to this fact. Consider for instance the sentence in (6a) and the noun phrase in (6b).

- (6) a. John surprised Mary enormously.
 b. John's polite friend

On top of the desired applications of the modifiers shown in (7), the applications in (8) may also be counter-intuitively derived.¹ Such derivations as in (8) must be blocked by additional principles.

- (7) a. $\exists e. \mathbf{surprise}(\mathbf{john}, \mathbf{mary}, e) \wedge \mathbf{enormous}(e)$
 'There is an event e of Mary surprising John such that e is enormous.'
 b. $\iota x. \mathbf{friend}(x, \mathbf{john}) \wedge \mathbf{polite}(x)$
 'the friend x of John such that x is polite'
- (8) a. $\exists e. \mathbf{surprise}(\mathbf{mary}, \mathbf{john}, e) \wedge \mathbf{enormous}(\mathbf{john})$
 'There is an event e of Mary surprising John and John is enormous.'
 b. $\iota x. \mathbf{friend}(x, \mathbf{john}) \wedge \mathbf{polite}(\mathbf{john})$
 'the friend x of polite John'

In the literature about events and modification, this problem has been addressed in different ways.² In Winter and Zwarts (2011), we formulate an account within the framework of Abstract Categorical Grammar (ACG, De Groot 2001, Muskens 2003). This account is based on two basic assumptions. First, in the structure, the referential argument is always the innermost argument, i.e. bound by the last lambda operator. This is illustrated in (9).

- (9) a. $\lambda x. \lambda y. \lambda e. \mathbf{suprise}(y, x, e)$
 b. $\lambda x. \lambda y. \mathbf{friend}(y, x)$
 c. $\lambda x. \mathbf{giraffe}(x)$

In (9a) the referential argument is the event argument e ; in (9b) it is the y argument of the predicate *friend* (the 'possessee'); in (9c) the one argument of the predicate *giraffe* is the referential argument.

¹For simplicity, we assume that the possessive DPs can be analyzed as definites, using the iota-operator.

²See for instance Higginbotham (1985), Eckardt (1998), Landman (2000), Lang (2003), Beaver and Condoravdi (2007), Eckardt (2010), Champollion (2011).

Second, Winter and Zwarts propose that this innermost semantic argument is never syntactically realized as a syntactic argument. This can be formalized in ACG by representing open positions in a syntactic or phonological structure means of variables, bound by lambda operators. The verb *surprised* has a slot for the subject (v) and for the object (u). The noun *friend* only has a complement u .³ The noun *giraffe* has no syntactic arguments. When all these syntactic arguments are saturated, what remains is always semantically of type (e,t) , with the e corresponding to the referential argument.

- (10) a. $\lambda u.\lambda v.v$ surprised u
 b. $\lambda u.$ friend u
 c. giraffe

From these two assumptions, the orientation of the modifier to the referential argument follows. Modifiers like *enormously* or *polite* can only apply to an expression which is semantically of type (e,t) and the e of this expression can only be the referential argument.

For convenience, and because these assumptions are independent of the particular ACG implementation we advocated, we here use a phrase structure representation, informally annotated with argument structures, similar in spirit to Williams (1981) and Higginbotham (1985). This is illustrated in Figure 1 for the noun phrase *a beautiful giraffe* and in Figure 2 for the infinitival verb phrase *beautifully dance*. The category labels and the linear precedence of nodes are not important for our story.

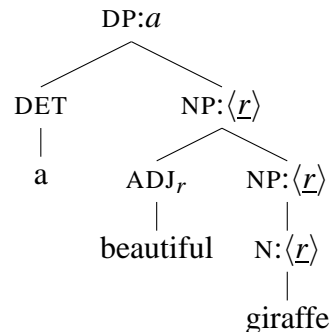


Figure 1: Modification of a nominal projection

The referential argument is underlined to distinguish it from the thematic argument(s). In Figure 1 the noun *giraffe* has the argument structure $\langle \underline{r} \rangle$, with only the referential argument \underline{r} and this r ends up as the reference of the whole DP. In Figure 2, we can see how the adverb *beautifully* applies to the referential event argument that is ‘saturated’ by an operator of existential closure, which can be associated to a functional head like I(inflection), as in the original proposal of Higginbotham (1985), or it can be a covert operator of some sort.

This system incorporates a principle that we call the *One Referential Argument Principle*. An NP or VP in structures like in Figure 1 and Figure 2 has exactly *one* referential argument to which both modifiers and closure operators are orientated. This principle will be important in our approach to nominal event arguments in the following sections.

³The complement of this noun is optional. How to represent optionality in ACG is discussed in Blom et al. (2012).

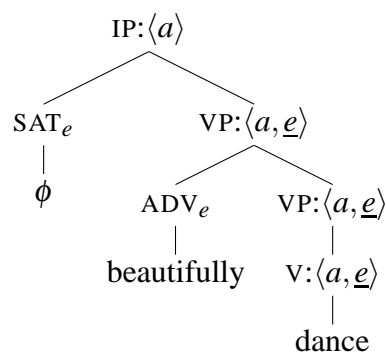


Figure 2: Modification of a verbal projection

There is much more to say about verbal event arguments and their interaction with quantifiers, negation, and modifiers and there have been some recent studies exploring specifically this basic issue (e.g. Beaver and Condoravdi 2007, Eckardt 2010, Champollion 2011). We have to leave a comparison with these approaches to another occasion. The rather basic assumptions that we have made are sufficient to address the status of events in nominals, to which we turn now.

3 Event modification in nominals

As mentioned in the introduction, a puzzle for modification arises in examples (11) and (12) (Bolinger 1967, Larson 1998). In these examples, the modifier is not necessarily orientated to the referential argument of the noun, and it can also pertain to an associated activity. In (11) the adjective can only apply to the activity, in (12) an ambiguity arises between orientation to the referent (Olga) or to the activity (dancing).

- (11) a. He is a hard worker.
 b. \Rightarrow He is hard.
 c. \Rightarrow He works hard.
- (12) a. Olga is a beautiful dancer.
 b. \Rightarrow Olga is beautiful or Olga dances beautifully.

This is not a rare phenomenon. We find it with a variety of adjectives in combination with deverbal nouns (see also Coppock 2009, Alexeyenko 2012):

- (13) *heavy smoker, violent campaigner, smooth operator, clean fighter, shallow breather*

In such cases, the adjective almost functions like a manner adverb. Contrary to what is sometimes thought (e.g. Levin and Rappaport 1988, Rappaport Hovav and Levin 1992), we also find prepositional phrases as modifiers, locating the associated activity in time or space.⁴

- (14) a. destroyer of the city in 1735
 b. killer of JFK in 1963

⁴Why such PP modifiers are not always acceptable with *-er* nominals, as Levin and Rappaport (1988) show (e.g. **inducer of protein growth with a new technique*), is an interesting problem which we are not able to address here.

- c. defeater of the Armada in 1588
- d. founder of Apple in a Silicon Valley garage

Event-orientated modifications with adnominal APs and PPs should be distinguished from *coerced* usages of modification (Pustejovsky, 1995), such as *fast car* or *fast dance*, which have also been taken to involve events, coming from the *qualia structure* of the noun. However, as the inferences in (15) below show, the adjective *fast* in these examples also holds of the referential argument of the noun (i.e. the car or the dance) and not only to an event associated with the noun. This is in contrast to the event-orientated adjectives in (16), which do not necessarily hold of the referential argument of the noun.

- (15) a. This Ferrari is a fast car (i.e. it moves fast). \Rightarrow This Ferrari is fast.
 b. This waltz is a fast dance (i.e. it has a fast tempo). \Rightarrow This waltz is fast.
- (16) a. This student is a hard worker (i.e. she works hard). \Rightarrow This student is hard.
 b. This pupil is a beautiful dancer (i.e. he dances beautifully). \Rightarrow This pupil is beautiful.

Therefore, we assume that coerced modifiers as in (15) are different from event-orientated modifiers as in (16) and require reference to events at a different level.

Larson (1998) elegantly solved the puzzle of event-orientated modifiers by proposing that the deverbal noun has an event argument in addition to its other arguments. One nice result is that modifiers that were analyzed as non-intersective, like *hard* in (11), are now analyzed as intersective after all, because they apply to the event argument. It also nicely explains the ambiguity of *beautiful dancer* (17a) and the relation between event orientation in the noun (17a) and the verb (17b).⁵

- (17) a. Olga is a beautiful dancer.
 $\exists e. \mathbf{dancing}(\mathbf{olga}, e) \wedge \mathbf{beautiful}(\mathbf{olga})$
 $\exists e. \mathbf{dancing}(\mathbf{olga}, e) \wedge \mathbf{beautiful}(e)$
- b. Olga dances beautifully
 $\exists e. \mathbf{dancing}(\mathbf{olga}, e) \wedge \mathbf{beautiful}(e)$

For simplicity and generality, we use an existential quantifier to bind the event variable of a noun, as shown in (17a). In many cases, as Larson points out, the event variable will be bound by a *habitual* operator. The noun *dancer* can refer to someone who is involved in one particular dancing event (episodic, stage-level), but also to someone who belongs who is regularly involved in dancing events (habitual, individual-level). This is related to what we said in Section 2 about the various ways in which the referential argument of a noun can be closed, either by an existential quantifier, or by a generic operator of some sort. For (17), this generic characterization can be formulated as: ‘Usually when there is an event *e* of Olga dancing, then *e* is beautiful’. Some nominals give rise to an episodic reading more easily, like *winner* or *visitor*. One can be a winner or visitor on the basis of one victory or visit, respectively.

⁵Interestingly, Larson’s two-place analysis of agent nouns is quite incompatible with a Neo-Davidsonian event semantics, which treats verbs as one-place predicates (e.g. Parsons 1990). It is hard to see how to elegantly treat a verb like *dance* as a one-place predicate, while treating its nominal derivation *dancer* as a two-place predicate as in Larson’s analysis. We follow Larson on this point and only assume a Davidsonian analysis of verbs, where all thematic arguments are semantically realized.

But what kind of nominal argument is the event position that Larson postulates? For one thing, its characterization must be different from that of the noun's referential argument: obviously it cannot end up as the reference of the noun phrase. This is shown in (18).

(18) *the beautiful dancer*

a. Available interpretations:

$\iota x. \exists e. \mathbf{dancing}(x, e) \wedge \mathbf{beautiful}(x)$

“the beautiful entity that functions as the agent of some dancing event”

$\iota x. \exists e. \mathbf{dancing}(x, e) \wedge \mathbf{beautiful}(e)$

“the entity that functions as the agent of some beautiful dancing event”

b. Unavailable interpretations:

$\iota e. \exists x. \mathbf{dancing}(x, e) \wedge \mathbf{beautiful}(e)$

“the beautiful dancing event that has some agent”

$\iota e. \exists x. \mathbf{dancing}(x, e) \wedge \mathbf{beautiful}(e)$

“the dancing event that has some beautiful agent”

We must block absurd derivations as in (18b). One way is a wholesale rejection of Larson's event argument in nominals. However, this would ignore the important analogies between verb and noun modifiers. If events play any role in adverbial modification to begin with, it seems hard to avoid Larson's conclusion that they must also play a similar role in adnominal modification as in (11)-(14). A line that is more consistent with Larson's analysis is to assume that the event argument in nominals is a third type of argument. As in verbs, this event argument is non-thematic (i.e. does not correspond to any syntactic position), but unlike verbal events, it is not referential (witness (18b)). The challenge for such an approach would be to show that it is motivated by anything beyond the need to block derivations as in (18b). At present we are unaware of such motivation. The approach we take here is to allow events to play a role in nominals, for similar motivations to Larson's. However, we will avoid problems of orientation and binding by letting event modification work at a separate level within the noun phrase. In the next section we elaborate on this proposal and its implications.

4 The structure of *-er* nominals

Given the One Referential Argument Principle, the only viable option of letting the event argument be a referential argument in nominals is to postulate that the event argument is the referential argument of a separate phrase within the noun phrase, which we informally call ‘event phrase’. Intuitively speaking, the idea is that the adjective in a case like *hard worker* applies to the unique referential event argument of the verb *work*. Something like this has been suggested earlier in Williams (2003) and Egg (2004), but working it out is less straightforward than it seems. To see this, consider the examples in (19).

(19) a. *Hebrew*:

ha- potrim nexona

the solvers correctly

‘the ones who solved correctly’

- b. *Dutch*:
 Jan is een foute/*fout inzender
 Jan is an wrong sender
 'Jan sent in a wrong solution.'
- c. a beautiful*(ly) dancer

The Modern Hebrew word *potrim* is a participle form, which functions both as the plural form of the verb *ptr* 'to solve' in the present, and as the equivalent of the English noun *solvers*. In (19a) this participle is used as the head noun of a definite noun phrase, but is modified by the adverb *nexona* 'correctly', in accordance with the verbal character of the participle. By contrast, in Dutch, event modifiers as in (19b) take the adjectival inflection (the schwa *-e*) that is characteristic of adnominal modifiers. Also in English, the adnominal modifier does not take the *-ly* suffix characteristic for adverbs but it has the adjectival form (19c). We propose that all these examples involve an 'event phrase', a constituent of which the referential argument is an event, but that the syntactic properties of this phrase may differ. Consider first the structure for Hebrew, represented in Figure 3.

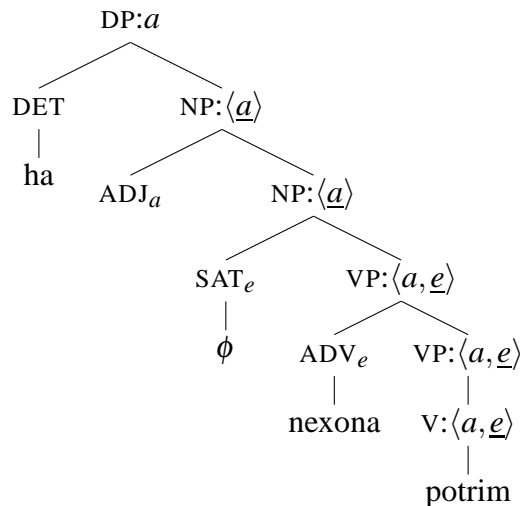


Figure 3: Modification in the Hebrew participle

The participle *potrim* in Hebrew is analyzed here as a verb, with a thematic argument *a* (the 'agent') and a referential event argument *e*. The adverb *nexona* applies to the referential argument in accordance with the principles described in Section 2. Note that *nexona* in Hebrew has here an unambiguous adverbial morphology, consistent with our assumption that it modifies a verbal event phrase. Then the SAT operator comes in, binding the event argument, turning the thematic argument *a* into the referential argument *a*, and turning the verb into a nominal. The modifiers that may apply at that point must have an adjectival form (*ha-nexonim*), and apply to the referential argument *a*. Finally, the determiner binds the referential argument and takes it as the reference of the whole DP. As a result of these processes, the Hebrew noun phrase (19a) unambiguously means "the ones who solved correctly", because the adverbial unambiguously modifies a verb. This is distinguished from adjectival modification as in *ha-potrim ha-nexonim* ('the-solvers the-correct-PL'), which occurs at a higher level, and unambiguously means: "the solvers who are correct".

Our analysis of the English example is very similar, apart from one syntactic difference, see Figure 4. The *-er* suffix applies very low and turns the verb into a noun, but it leaves the verb's referential argument – the event – untouched. As a result, the lower adjective *beautiful* modifies a nominal event phrase and not a verbal one. The same would hold for Dutch. The idea is that *dancer* behaves syntactically like a special noun but semantically like a verb (with respect to its referential argument). The subscript *er* on the NP indicates that this phrase derivation is incomplete, and cannot serve as a proper NP before the derivation of the higher phrase, where the SAT operator applies and closes the event argument. The higher position for the adjective within the NP can only modify the referential argument of the whole noun phrase, in this case the agent. In our account, the ambiguity of nominals like *beautiful dancer* follows from these two structural derivations with *-er* nominals.

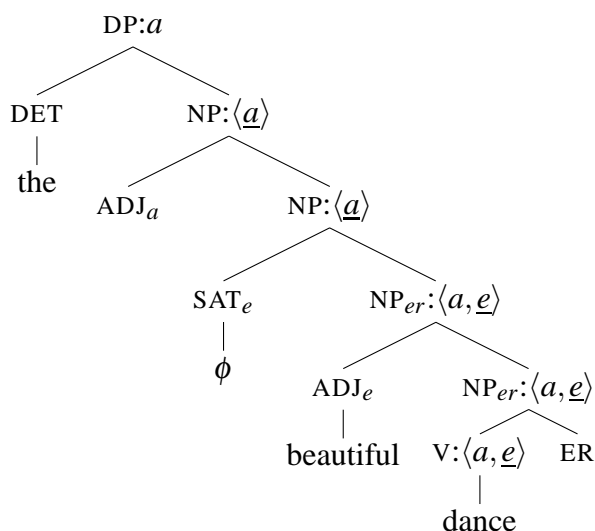


Figure 4: Modification in the English *-er* nominal

This analysis improves over Larson's in making a principled distinction between nouns like *dancer* and verbs like *dance*, while still allowing event-orientated modification with deverbal nominals. The referential argument of the verb is an event, the referential argument of the noun is the agent, but it also involves an event, in virtue of the verb from which it is derived. Our analysis allows event-orientated modifiers, like Larson, but it does not allow the event argument to end up as the reference of the noun phrase. In addition to solving the problem of the NP reference there are more advantages to this way of reformulating Larson's proposal. If our analysis is on the right track then underlying verbs are important in allowing events and, other things being equal, we do not expect event modification with non-deverbal nouns. The following contrasts lend support to this prediction.

- (20) a. beautiful dancer vs. ?beautiful ballerina
 b. hard worker vs. ?hard employee
 c. light traveler vs. ?light passenger

If nouns are associated with an activity on the basis of their meaning, then we would expect no contrast, because ballerinas dance, employees work, and passengers travel. But there is a

clear contrast in these minimal pairs. We are aware of possible counter-examples like *just king*, *fast horse*, *skillful surgeon*, *stray bullet*, *daily newspaper*, *occasional sailor* that have also been analyzed as involving modification of an event argument of the noun. There are different problems involved here, each of which deserves much more attention than we can give, but we believe that there are reasons to separate them from the simple event-orientated modifications that we have so far analyzed. In examples like *just king*, *fast horse*, and *skillful surgeon*, we propose that the adjective applies to the referential argument of the noun, as shown by the entailments in (21) below. As mentioned above, for the adjectives *just* and *fast* a process of coercion might be involved (see Pustejovsky 1995). For a more complicated analysis of *skillful*, see Winter and Zwarts (2012).

- (21) a. Arthur is a just king. \Rightarrow Arthur is just.
 b. Passeland is a fast horse. \Rightarrow Passelande is fast.
 c. Barnard was a skillful surgeon. \Rightarrow Barnard was skillful.

The examples *daily newspaper* and *occasional sailor* are part of a class of modifications that involve the frequency of event, which is not a notion that can be expressed by predication over a single event. See Gehrke and McNally (2011) for a recent treatment of this class in terms of a higher-order notion of event type. Idiomaticity and collocation might play a role in the special behavior of examples like *stray bullet*.

Another result from our analysis has to do with ordering of adjectives (see Larson and Takahashi 2007). The ordering in (22a) allows for two readings of *beautiful*, but the ordering in (22b) for only one reading. The bracketing in (23) shows that this is because *blonde*, which can only apply to the agent, after saturation, leaves two different positions for *beautiful* below it, but only one above it.

- (22) a. Olga is a blonde beautiful dancer.
 \Rightarrow Olga is blonde and she dances beautifully₁
 \Rightarrow Olga is blonde and beautiful₂
 b. Olga is a beautiful blonde dancer.
 \Rightarrow Olga is blonde and beautiful₃
- (23) [beautiful₃ [blonde [beautiful₂ [SAT [beautiful₁ [dancer]]]]]]

5 Conclusion

We have focussed on modification of *-er* nominals and developed an analysis that only expects such nominals to license event modification. Above we have pointed out some potential counterexamples and their possible accounts. Now we would like to point out some other cases where an adjective or PP seems to modify an event associated to a non-derived noun, but which cannot be easily explained away. Even though they are more restricted in the event-orientated modifiers they allow, consider the following examples.

- (24) a. He was the champion in 1981. (cf. *The champion was in 1981.)
 b. This is the bus to Tel Aviv. (cf. ?That bus is to Tel Aviv.)
 c. She is the new president. (cf. #She is new.)

- d. She will be mayor till 2014. (cf. *She will be till 2014.)

These examples present us with a dilemma, because there is no verb here responsible for an event. The modifiers can not be used predicatively, so we cannot treat these cases as involving coercion. Also frequency adverbials are not relevant here. One possibility is that what looks like a modifier in (24) is really *selected* by the noun, as an argument. This seems like a possible analysis for (24a) and (24b), but is unlikely for the adjective in (24c) and the temporal PP in (24d). It is also not clear how to independently motivate this additional mechanism.

But suppose that some non-deverbal nouns in fact do have an ‘event phrase’ even though they are not derived. If this is possible, then these nouns can enter the derivation without the saturation operation, i.e. as NP_{er} : nouns of which the event argument is the referential argument. This is illustrated in Figure 5 for the DP *the champion in 1981*.

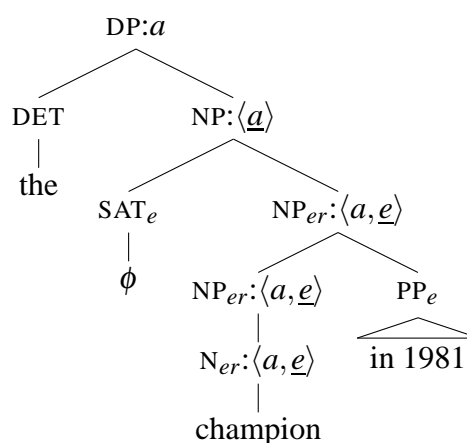


Figure 5: *champion* as an event phrase

This approach to events in nominals would allow the same coverage as Larson’s proposal, while having the right referential argument at every point in the derivation. What is not yet clear, however, is what nouns submit to this analysis. If we also allow nouns like *ballerina*, *employee*, and *passenger* to be NP_{er} , then we can no longer account for the contrast in (20). There is the considerable empirical problem of finding out which event modifiers can occur with which nouns (deverbal or not) and why, and whether these modifiers are of the types discussed here (e.g. *bus to Tel Aviv*) or of the ‘coercion type’ (*fast bus*).

There are other issues related to events in nominals that we have not discussed here. For instance, how do quantifiers and negation interact with events in the noun phrase? Why does sentence (25a) only have meaning (25b) and not meaning (25c), in other words, why does the existential closure over the nominal event ($\exists e_1$) have narrow scope with respect to negation?

- (25) a. No winner smiled
 b. $\neg \exists x. \exists e_1. \mathbf{winner}(x, e_1) \wedge \exists e_2. \mathbf{smile}(x, e_2)$
 c. $\exists e_1. \neg \exists x. \mathbf{winner}(x, e_1) \wedge \exists e_2. \mathbf{smile}(x, e_2)$

This follows straightforwardly from our analysis, because the determiner *no* can only apply after the SAT operator has turned the event phrase into a regular nominal. For further details see Winter and Zwarts (2011).

Although the assumptions that we have made in this paper are not new, but go back to the work of Davidson (1967), Higginbotham (1985) and others, what is new is the consistent application of these assumptions in the domain of event arguments of *-er* nominals. The One Referential Argument Principle leads us to restore a picture of nouns and verbs that we believe is conceptually more elegant than Larson's introduction of free variables for events, and possibly closer to Davidson's original spirit. In our proposal, nouns have one referential argument for objects and verbs have one referential argument for events. If some nouns seem to have two referential arguments, it is only because they are derived from a verb-like base or, perhaps, because some event structures may be idiomatically introduced in the lexicon.

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