

# Dimensional Approach to Derived Nominals<sup>1</sup>

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## 0. Introduction

Consider the following sentences.

- 1
  - a. John's knowledge of French is great.
  - b. \*John's two hours of knowledge of French is great.
  - c. \*John's three knowledges of French is great.
  
- 2
  - a. The destruction of the city was incomplete.
  - b. (?) There was destruction of the city for two hours.
  - c. \*There were three destructions of the city.
  
- 3
  - a. The discussion of the presidential voting was sufficient.
  - b. There were two hours of discussion of the presidential voting.
  - c. There were seventeen discussions of the presidential voting.

There is a gradation of the grammaticality among the underlined derived nominals. The (a)-examples show that derived nominals can be modified by degree modifiers. The (b)-examples show that the derived nominals are measured by the duration of time. The (c)-examples show that the derived nominals are counted by numerals. Regarding (2c), while it is acceptable if 'city' is taken to be an abstract political entity that can be instantiated (or rebuilt) at different places and times, a concrete city (with buildings and houses) cannot be destroyed more than once. I assure, tentatively, that this latter fact is reflected in the meaning of 'city' and 'destroy'. Depending on the kind of derived nominals, the grammaticality changes.

The central purpose of this paper is to explore the underlying hierarchy that would give rise to these facts. In this paper, I will argue that :

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<sup>1</sup> In this paper, derived nominals refer to the type whose relevant nominalizing morphemes are "-tion" or "-y". I am not going to discuss gerund or mixed type (poss -ing of ); e.g., John's refusing of the offer.

- 4 Derived nominals have internal dimensions and those dimensions are structural.
- 5 Each dimension in derived nominals corresponds to state/process/individuation of event.

I claim that the eventualities --- state/process/individuation of event --- are hierarchical in derived nominals. More precisely, if a relevant derived nominal is countable, this derived nominal consists of event/process/state. If a relevant derived nominal is not countable, but can be modified by durational phrase, this derived nominal consists of process/state. If a relevant derived nominal is not countable and cannot be modified by a durational phrase, it only consists of state.

- 6 Hierarchical eventualities can be converted by classifiers, measure words, and argument structure.
- 7 Derived nominals have inherent properties (mass vs. count). I claim that the transformational approach to derived nominals (van Haut and Roeper 1998) is incorrect since it cannot capture this inherent property of derived nominals.

This study also attempts to show that there is a parallelism between clausal and nominal levels with respect to indication of eventualities. In the clausal level, small verbs indicate the complex events, and in the derived nominals, numeral classifiers and mass words do.

This paper is structured as follows. Section 1 will examine the traditional treatment of events as an argument structure in noun phrases. Section 2 will investigate how derived nominals are formed, and how much this approach can capture the properties of derived nominals. Section 3 will introduce a dimensional view of noun phrases, which is advocated by Muromatsu (1998). Section 4 reveals how many and what kind of properties derived nominals have. I will depart from Muromatsu's theory in one respect: Dimensions of derived nominals are converted not only by classifiers and measure words, but also by argument structures. In section 5, I also show the support of dimensional views to derived nominals with respect to adjectival modification. Section 6 will discuss the parallelism between derived nominals and clauses with respect to indications of events.

## 1. Eventish Argument Structure in Noun Phrases

As mentioned in the introduction, I claim that there are, at least, two ways in which events are implicated in the semantics of natural languages; event as an argument structure<sup>2</sup> and internal events. We will discuss the first of these.

Davidson (1967) claims that event variable  $e$  is an argument structure, in addition to the canonical argument structures. The general form of the verb is  $\Phi(e,x,y)$ , where it reads that there is an event  $\Phi$  of  $y$  by  $x$ . This approach is shown nicely in the inference patterns below:

- 8
- a. Brutus stabbed Caesar in the back with a knife.
  - b. Brutus stabbed Caesar in the back.
  - c. Brutus stabbed Caesar with a knife.
  - d. Brutus stabbed Caesar.

(Parsons 1990:13)

The entailment goes through from (a) to (b) and (c), and from (b) or (c) to (d), not vice versa. As the relevant logical forms show, “subject”, “object”, and adjuncts like “in the back” or “with a knife” are participants of the event  $e$ , which is a “stabbing”.

- 9
- a.  $e$  [stabbing ( $e$ )  $\wedge$  sub ( $e$ , Brutus)  $\wedge$  obj ( $e$ , Caesar)  $\wedge$  in ( $e$ , back)  $\wedge$  with ( $e$ ,k)]
  - b.  $e$  [stabbing ( $e$ )  $\wedge$  sub ( $e$ , Brutus)  $\wedge$  obj ( $e$ , Caesar)  $\wedge$  in ( $e$ , back)]
  - c.  $e$  [stabbing ( $e$ )  $\wedge$  sub ( $e$ , Brutus)  $\wedge$  obj ( $e$ , Caesar)  $\wedge$  with ( $e$ ,k)]
  - d.  $e$  [stabbing ( $e$ )  $\wedge$  sub ( $e$ , Brutus)  $\wedge$  obj ( $e$ , Caesar)]

(Parsons 1990:14)

More generally, the relation between the sentence and the modifiers are shown as follows:

10  $[\Phi(e,x,y) \wedge \Psi(e)] \rightarrow \Phi(e,x,y)$

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<sup>2</sup> See Davidson (1967), Higginbotham (1985)(2000), Larson (1995)(1999), Larson and Segal (1995), Parsons (1990), Pietroski (1998a,b)(2000), Rappaport Havov and Levin (1992), among others.

“ $\Phi(e,x,y)$ ” indicates the predicate together with its arguments, and “ $\Psi(e)$ ” is an adjunct. In this picture, adjuncts are one-place event predicates. In this view, modifiers are conjuncts of the event description. Because the adjuncts are conjuncts of event descriptions, the entailment pattern from (a) to (b) and (c), and from (b) or (c) to (d) is straightforward; the inferences are instances of conjunction reduction (in the scope of existential quantifiers).

Extending this view to noun phrases, Larson (1995,1999) and Larson and Segal (1995) argue that nouns (especially, -er nominals in their examples) are semantically decomposed into event and argument. Thus, the following sentence is ambiguous between individual modification and event modification.

11 Olga is a beautiful dancer.

The relevant interpretations are as follows:

- 12 a. Olga is a dancer and Olga is beautiful.  
b. Olga is beautiful as a dancer/Olga dances beautifully.

Larson (1995,1999) and Larson and Segal (1995) claim that the ambiguity can be explained by decomposing the relevant nouns into event and argument.

13 dancer (x) iff  $e[\text{dancing}(e) \wedge \text{agent}(e,x)]$ <sup>3</sup>

As a further step, Larson considers adjectives as one-place predicates, which is the same as adjuncts at the clausal level.

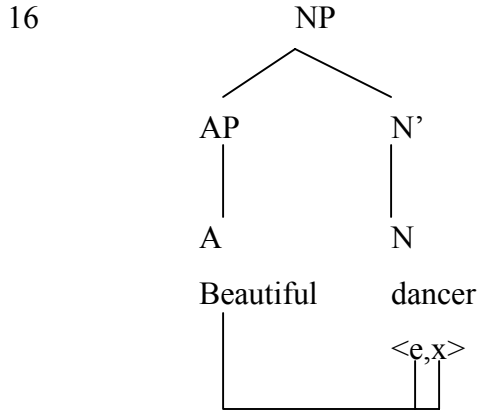
14 beautiful (e/x)

As a last step, Larson specifies the semantics of adjoined AP, given (11) has two readings.

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<sup>3</sup> This notation is different from Larson's. I use this form for simplicity.

- 15 a.  $NP[N(e,x) \wedge AP(x)] \rightarrow$  Individual modification  
 b.  $NP[N(e,x) \wedge AP(e)] \rightarrow$  Event modification



This view requires that we assume quantification over events in noun phrases, as in the case of clausal levels.

Based on Larson and Larson and Segal's work, it is plausible to consider derived nominals in the event semantics view. For instance, the derived nominals in (1) to (3) can be represented as follows:

- 17  $e[e \text{ is John's knowledge of French}] \text{ iff } e[\text{knowledge}(e) \wedge \text{Subject}(\text{John},e) \wedge \text{Object}(\text{French}, e)]$   
 18  $e[e \text{ is destruction of the house}] \text{ iff } e[\text{destruction}(e) \wedge \text{Object}(\text{the house}, e)]$   
 19  $e[e \text{ is a discussion of the presidential voting}] \text{ iff } e[\text{discussion}(e) \wedge \text{Object}(\text{the presidential voting}, e)]$

In this view, derived nominals and argument structures are taken as the participants of the relevant events.

However, if event  $e$  is an argument, it is plausible to expect it somewhere in syntax. It is not clear where argument  $e$  resides in this picture.<sup>4</sup> In addition, although

<sup>4</sup> Rappaport Havov and Levin (1992) specify the event position in NP syntax with respect to derived and –er nominals. According to them, an event variable is lexically saturated under N for –er nominals and  $e$  is at N' for derived nominals, where adverbials can be a conjunct of  $e$ . However, there are problems in their approach. First, if  $e$  is lexically saturated under N for –er nominals, their theory cannot explain why the

event position in logical form can nicely account for entailment patterns or ambiguity in adjectival modifications, this theory is not concerned with the kind of property the relevant verbs or nouns have. For instance, intuitively, “knowledge” means some kind of state, but “discussion” means some kind of event<sup>5</sup>. From the syntactic perspective, both of the derived nominals are categorically nouns, but there is a difference between them. While “discussion” is countable, “destruction” is not. This observation correlates with the inherent properties of common nouns such as “water” or “desk”. Semantically, mass nouns imply substance, and count nouns do individuation. Now, the question is whether or not mass/count properties can correlate with eventualities in derived nominals. In other words, do mass noun type derived nominals possess certain eventualities while count type derived nominals do others? Treating event as an argument structure does not tell us anything about the kind of eventualities in derived nominals.

This treatment of event as an argument structure and kind of event is similar to the situation between atoms and sub-atomic particles. Atoms are called so because they were not considered to have parts. So, as long as atoms are concatenated with other atoms to form other objects, everything is fine. However, atoms have internal properties: sub-atomic particles. Then, several questions arise: How many sub-atomic particles exist? What properties do they have? How are they distributed?

Now, apply the aforementioned analogy to derived nominals. The question is: What kind of properties do derived nominals have and how are they distributed? Finding out the answers is the main thrust of this paper. In the next section, we will explore how derived nominals are treated. As a case in point, we will observe the transformational approach by van Haut and Roeper (1998).

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event modifier “frequent/constant”, which is attached to NP in their syntax, can form grammatical forms, e.g., frequent flyer. The event variable is too far to be a conjunct of an event modifier. Second, there isn’t any theoretical motivation as to why the event variable appears in such an asymmetrical manner between derived and –er nominals. However, I won’t attempt to solve the location of e in this paper.

<sup>5</sup> From Parsons (1990), Larson and Segal (1995) cite a predicate “Hold(e)” for state type event. Thus, ‘dancer’ is true iff  $e$  [dancing (e) ^ Agent (e,x) ^ Hold (e)]. It is a plausible extension to use “hold” and “cul(mination)” to distinguish between event and state. However, as a later section (adjectival modification) shows, eventuality is not a simple dichotomy.

## 2. Treatment of Derived Nominals: Transformational Approach

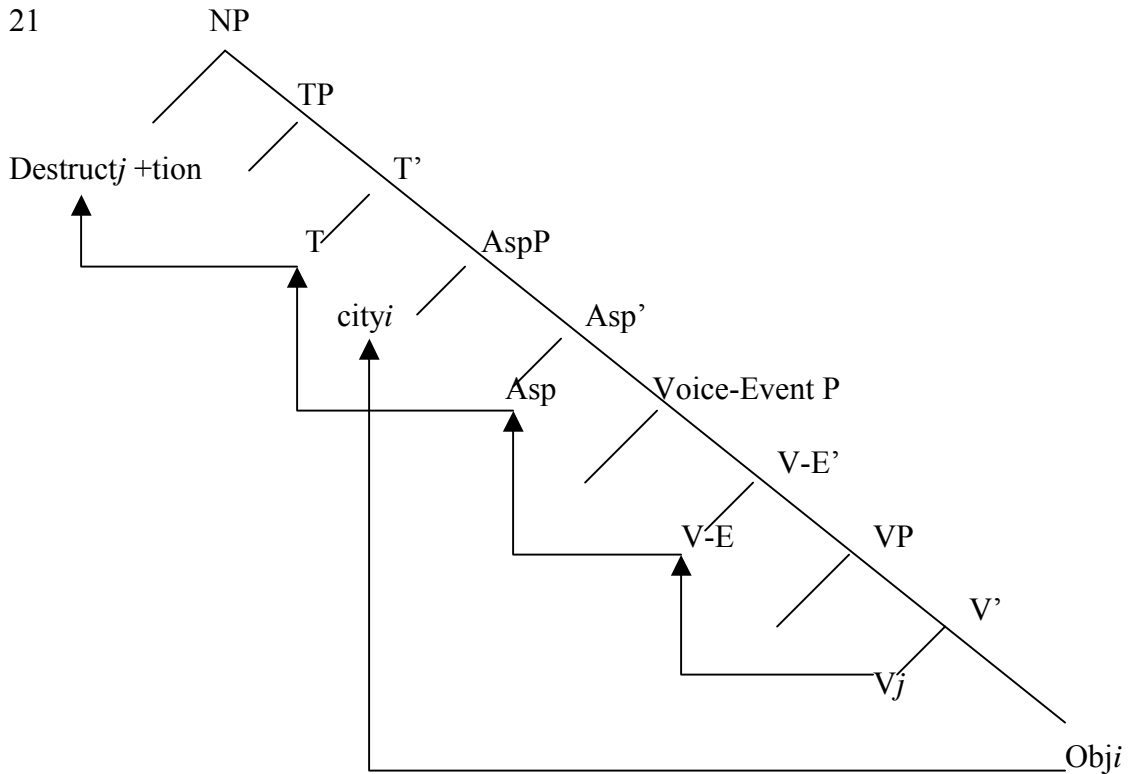
Since Chomsky (1970), it is assumed that derived nominals are base-generated in the lexicon rather than syntactically derived. However, arguing against this view, van Haut and Roeper (1998)(vHR) advocate that derived nominals are generated through the movement of VP to the nominalizer morphemes (“-tion”, “-ing”, or “-y”) to check nominal features. Accordingly, vHR claim that derived nominals contain VP in addition to some functional projections: TP, AspP, and Voice-EventP. As evidence, vHR show the following facts by citing Fu, Roeper, and Borer’s work (1995).

- 20
- a. Appearance of VP adverbs
    - ? John’s explanation of the problem immediately (to the tenant)
    - \*John’s version of the problem immediately
    - John’s immediate version of the problem
  - b. Do-so Test
    - John’s evasion of taxes and Bill’s doing so, too
    - \*John’s trip to Hawaii and Bill’s doing so, too
  - c. Word Order (verb movement over VP adjoining adverbs)
    - The destruction so carefully of the documents
    - \*He destroyed so carefully the documents.
    - He so carefully destroyed the documents.

(examples in (20) are from van Haut and Roeper 1998)

Based on the evidence, vHR claim that derived nominals have the following derivation:

21



(van Haut and Roeper 1998)

Although it is interesting to treat nominalization as the result of movement, there are a few problems. First, derived nominals have not only a verbal meaning, but also an object/non-verbal reading: e.g., construction as verbal meaning and as a building. Van Haut and Roeper's approach shows only the former. Second, derived nominals often do not have overt argument structures: e.g., "destruction" vs. "destruction of the city". How does van Haut and Roeper's theory account for this fact? There is also an interesting observation by Mourelatos (1981). According to Mourelatos, some derived nominals (including gerundive case in his cases) are countable and some are not. Mourelatos offers the following examples:

- 22
- a. Vesuvius erupted three times. ↔ There were three eruptions of Vesuvius.
  - b. Mary capsized the boat. ↔ There was a capsizing of the boat by Mary.

- c. John pushed the cart for hours. ↔ For hours, there was pushing of the cart by John.
- d. John hates liars. ↔ There is hate by John of liars.

Mourelatos notices that there is a relation between mass/count and atelic/telic (see also Leech 1970, Bach 1986). Thus, derived nominals show some property: mass vs. count. Recall the derivation of the derived nominals by vHR. How can they explain why a derived nominal such as “eruption” can be countable while “destruction” cannot, although both nominals have the same nominalizing morpheme “-tion”? In order to account for this fact from their point of view, vHR have to come up with more mechanisms to account for mass/count property.

In my view, the mass/count property in derived nominals is an inherent property. For example, “water” and “destruction” can form a group as mass terms, while “desk” and “eruption” can form other groups as count terms. This view, however, raises some immediate questions. “Water” and “desk” are used to refer to concrete things, “destruction” and “eruption” are used to talk about events. Given this fact, can we treat derived nominals on a par with common nouns? Second, in regard to mass/count dichotomy, can we always separate mass/count completely? Or does this distinction have something more? In the next sections, we will examine these questions.

### **3. Dimensional Theory and Internal Hierarchy in Noun Phrases**

Uriagereka (1999) claims that syntactic categories (Nouns or Verbs) are not primitive, but a result of the computational system of the human language. Usual syntactic derivation (say merger) is concerned about concatenation of lexical items. This kind of derivation (horizontal syntax) takes it for granted that categories like verbs or nouns are primitives, and thus, horizontal syntax does not say anything about what is in lexical items. However, Uriagereka claims that human lexical concepts are recursively built in layers. In other words, if there is dimension 1, the next dimension 2 can be defined based on 1; that is,  $1+1$ . The third dimension 3 can be defined by  $2+1$ , and the fourth dimension 4 can be defined by  $3+1$ , and so on. Thus, dimension can be defined inductively, based on the previous dimension  $n$ . What is important in this view is that the



<b>Abstract</b>	<b>Mass</b>	<b>Count</b>
Concept	Concept	Concept
	Mass	Mass
		Countability

In addition, she notices that there is a gradation in grammaticality among nouns.

- 26 abstract noun “peace”
- Mary gave a peace sign.
  - \*The peace weighs six pounds.
  - \*John bought three peaces.

- 27 mass noun “honey”
- Mary found a honey bee.
  - This honey weighs six pounds.
  - \*John bought three honeys.

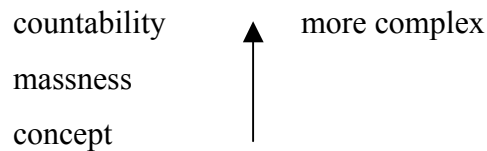
(This reading is fine if “honeys” denotes three types. However, this reading forces the reader to take the meaning of “honeys” as containers of honey. This is similar to the case of “destruction”, which forces the reader to change the meaning of argument structure “city” from concrete entity to abstract political entity since only the abstract entities could be instantiated and destroyed three times.)

- 28 count noun “book”
- Mary is a book reviewer.
  - This book weighs six pounds.
  - John bought three books.

As the examples show, count nouns can be accessible from concept, massness, and countability; mass nouns can be accessible from massness and concept; and abstract nouns can be accessible from concept. In other words, if a noun is countable, it also includes massness and concept. If a noun is mass, it includes concept. However, abstract nouns only include concept.

The above observation also shows that there is hierarchy in nouns: count nouns are higher and abstract nouns are lowest. This fact can be clearly translated into the dimensional view. That is, higher-dimensional words include lower dimension(s). In addition, higher-dimensional words can be defined by the lower-dimensions in inductive steps.

29 Hierarchy



Then, the immediate question is: What converts from the lower dimension to the higher dimension? Muromatsu’s answer is to utilize mass words and classifiers.

Classifier languages like Japanese show the obligatory numeral classifiers to count.

- 30    ni -hon      no banana  
       two classifier gen banana  
       “two bananas”

As the example shows, Japanese shows the classifier to count, but as the English equivalent shows, English does not show the classifiers.<sup>6</sup> As for the mass words, these are used to quantize the entity.

- 31    a. ni-kilo no banana  
       two kilogram gen banana  
       “two kilograms of banana”  
       b. two kilograms of gold

Notice that the countable noun “banana” can mean mass sense. If the mass and count nouns are explained in dichotomous fashion, this fact cannot be captured.

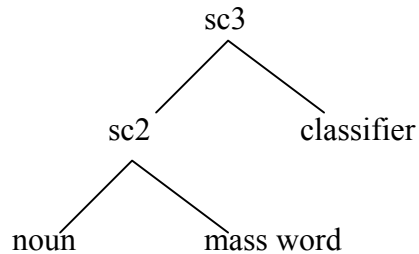
- 32    \*two golds<sup>7</sup>

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<sup>6</sup> Muromatsu (1998) assumes that English has pro classifiers.

However, (32) is ungrammatical. This means that the noun “gold” doesn’t have the third dimension. Muromatsu captures the internal hierarchy by small clauses.

33



In this view, both mass words and classifiers play a role in converting lower dimensions to higher dimensions. Below is the property of each dimension.

- 34
- 1D quality (all three kinds of nouns require this bare minimum). This level of the nominal can be modified by intensifiers.
  - 2D substance or material
  - 3D individuation

From this view, nouns have three dimensions, and each dimension can be converted by measure words and classifiers.

#### 4. In the Case of Derived Nominals

Based on Muromatsu’s work, I will investigate derived nominals. As reviewed, the transformational treatment of derived nominals cannot capture an inherent property of derived nominals, such as countability or uncountability. Because this property is inherent and seems to be related to the grammaticality as in (1), (2), and (3) (repeated here as 35, 36, and 37), it is a quite plausible step to apply Muromatsu’s theory to derived nominals.

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<sup>7</sup> There are plural forms in mass terms: two coffees. However, this means two containers of coffee. Coffee still is not countable. As a matter of fact, you can say “coffee hutatsu” (two coffees) in Japanese, but the classifier used here is a generic one, not particular kinds for certain things. Muromatsu claims that those nouns with specific kinds of classifiers have internal structures. I will follow her claim.

- 35 a. John's knowledge of French is great.  
 b. \*John's two hours of knowledge of French is great.  
 c. \*John's three knowledges of French is great.
- 36 a. The destruction of the house was incomplete.  
 b. (?) There was destruction of the city for two hours.  
 c. \*There were three destructions of the city.
- 37 a. The discussion of the presidential voting was enough.  
 b. There were two hours of discussion of the presidential problem.  
 c. There were seventeen discussions of the presidential voting.

As a first step, we will observe the relation between the original verbs and their derived forms with respect to countability and uncountability.

#### **4.1. Kinds of Derived Nominals and Binary Features**

As shown below, there is a correlation between the appearance of cardinal-number adverbs at the sentential level and cardinal modifiers in nouns.

- 38 a. The volcano erupted.  
 b. The volcano erupted seventeen times.
- 39 a. There was an eruption of the volcano.  
 b. There were seventeen eruptions of the volcano.

What is interesting in this group is the appearance of “a” or “at least one” if the specific number of the event is not stated as in (39a).<sup>8</sup>

Contrary to this group, there is a class of nouns which is not countable. In the corresponding sentential level, the cardinal-number adverbs do not show up.

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<sup>8</sup> Mourelatos (1981) does not show the actual example of using “at least one” in the nominalization pattern.

- 40 a. Taro destroyed the volcano.  
 b. \*Taro destroyed the volcano seventeen times.  
 c. John knows French.  
 d. \*John knows French seventeen times.
- 41 a. There was destruction of the volcano by Taro.<sup>9</sup>  
 b. \*There were seventeen destructions of the volcano by Taro.  
 c. John's knowledge of French is great.  
 e. \*John's seventeen knowledges of French are great.

These facts hold true for Japanese counterparts, too.

- 42 a. Kazan ga zyuunana-kai hunka sita.  
 Volcano nom seventeen cl (times) erupt past  
 "The volcano erupted seventeen times".
- b. Kazan no zyuunanakai no hunka.  
 volcano gen seventeen cl (times) gen eruption  
 "Seventeen eruptions of the volcano"
- 43 a. \*John ga sono ie o zyuunana-kai torikowasita.  
 John nom that house acc seventeen cl (times) destroyed  
 "John destroyed the house seventeen times".
- b. \*John niyuru sono ie no zyuunana-kai no torikowasi.  
 John by that house gen seventeen cl (times) destruction

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<sup>9</sup> I am not concerned with the situation where Taro somehow rebuilds the volcano and destroys it over and over again. Rather, I take that once the object is destroyed, it is gone. However, some speakers of English accept that "destroying" can be countable: e.g., there were three destroyings of the cities. Thus, if this is true, there is an asymmetrical property between "destroying" and "destruction". According to Parsons (1990), if the relevant nominalizations have a derived form like "destruction", the "-ing" form is avoided by the blocking effect. However, there may be more to say. For some reason, "destroying" can be a 3D form of "destruction". As Chomsky (1970) notices, a mixed form like "destroying" shows a peculiar property: mixed forms cannot be modified by adjectives. If "destroying" is somehow countable, but "destruction" is not, there may be an asymmetrical relation between sentential cardinal numbers and the derived nominals. In future research, I will investigate whether or not the blocking effect is a matter of style or more.

“John’s seventeen destructions of the house”

- 44 a. \*John wa furansugo o zyuunana-kai kokoroeteiru<sup>10</sup>  
John top French acc seventeen cl (times) know  
“John knows French seventeen times”.
- b. \*John niyuru furansugo no zyuunana-kai no kokoroe.  
John by French gen seventeen cl (times) gen knowledge  
“John’s seventeen knowledges of French”

In both Japanese and English, there is a correlation between the original verbs and their derived forms with respect to count vs. uncount (mass). Regarding derived nominals, there are two remarks. First, as we observed in the previous section, Japanese shows the obligatory classifier –kai “times” to count the number of events. As in the case of common nouns, English does not show a classifier. Second, the dichotomy between count and mass looks like the traditional treatment of common nouns. However, if Muromatsu’s theory is right, and if we treat derived nominals on a par with common nouns, we can predict that there may be a type of derived nominal which shows the dual-life status as in Muromatsu’s example (23) (repeated here as 45).

- 45 a. Put some apple in the salad.  
b. Put some apples in the salad.

This prediction is borne out in the following verb and its derived form.

- 46 a. People discussed the presidential voting seventeen times.  
b. People discussed the presidential voting for three hours.
- 47 a. There were seventeen discussions about the presidential voting.  
b. There were three hours of discussion about the presidential voting.

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<sup>10</sup> “Kokoroe”(knowledge) is from Martin (1975).

Here, “for three hours” shows the duration of the event. Intuitively, this is similar to “a liter of” as in “a liter of water” to express the substance or material. Regarding “seventeen times”, this shows the individuation of the event. The same holds for its Japanese counterpart.

- 48 a. Hitobito ga daitooryoo no hyoo nituite zyuunana-kai hanasiatta.  
 People nom president gen voting about seventeen cl (times) discussed  
 “People discussed the presidential voting seventeen times”.
- b. (hitobito niyuru) daitooryoo no hyoo nituite no zyuunana-kai no  
 People by president gen voting about gen seventeen cl (times) gen  
 hanasiai.  
 discussion  
 “seventeen discussions about the presidential voting by people”
- 49 a. Hitobito ga daitooryoo no hyoo nituite sanzi -kan hanasiatta.  
 People nom president gen voting about three hours during discussed  
 “People discussed the presidential voting for three hours”.
- b. (hitobito niyuru) daitooryoo no hyoo nituite no sanzi -kan no  
 People by president gen voting about gen three -duration gen  
 hanasiai.  
 discussion  
 “three hours of discussion about the presidential voting by people”

As expected, the classifier –kai “times” shows up this time, too. From this observation, it seems valid to treat common nouns and derived nominals on a par. This means that there are internal dimensions in derived nominals, too. In addition, classifiers and mass words can convert dimensions. This is good news.

However, there is a crucial difference between common nouns and derived nominals. Classifiers and mass words for derived nominals are time-related (e.g. three

times, two hours of), with which common nouns are not associated (e.g. \*two hours of water, \*two times of desk). In other words, derived nominals have time features which are related to the relevant events. In addition, recall that Muromatsu questions the existence of [-concrete][+count] and stipulates that [+concrete] is necessarily [+count] to reveal hierarchy in nouns (see 25). Contrary to Muromatsu's prediction, derived nominals can fit into this group. Now, the question is whether or not derived nominals can be placed into Muromatsu's system. Or alternatively, should her system be modified to capture dimensions for derived nominals. We will consider this problem in the next subsection.

#### **4.2. Each Dimension as Eventuality**

In the previous section, we observed that derived nominals have the same properties as common nouns do; count vs. mass are not dichotomous, but hierarchical. However, I didn't explain the exact properties that each dimension in the derived nominals has, nor did I mention exactly what dimensions are converted. So, in this section, I will address these questions.

To begin with, recall that each dimension in Muromatsu's system has the following characteristics:

- 50     **1D**     quality (all three kinds of nouns require this bare minimum.) This level shows quality. Thus, it is possible to modify 1D by intensifiers.
- 2D**     substance
- 3D**     individuation

Every noun has 1D as a bare minimum. As Muromatsu claims, 1D nominals can be modified by intensifiers.

- 51     a. He was less statesman than warrior.
- b. She is more mother than wife.

(Muromatsu 1998)

In these examples, nouns like “statesman”, “warrior”, “mother”, and “wife” show the degree of qualities. At the same time, nouns in this level act as if they are adjectives.

- 52     a. Mary gave a peace sign.  
       b. Mary found a honey bee.  
       c. Mary is a book reviewer.

1D is converted to 2D by measure words. This level has substance or materials.

- 53     a. two kilograms of gold.  
       b. two liters of water.

Both “gold” and “water” show substance in these measure constructions.

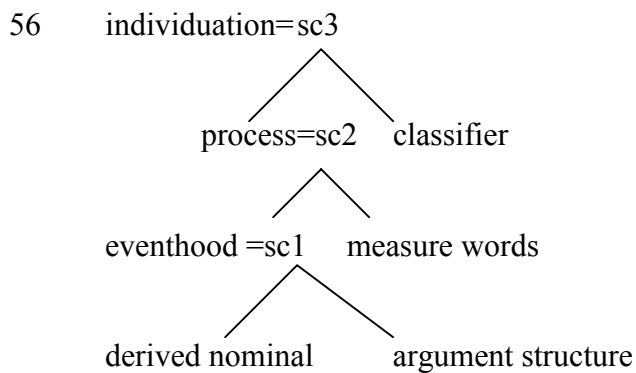
Finally, 2D is converted to 3D by a classifier. The function of classifiers is to individuate the substance of 2D. In the spirit of the dimensional theory, because 3D is the most complex dimension, it includes concept and substance.

- 54     a. Mary is a book reviewer.  
       b. The book weighs three pounds.  
       c. Mary bought three books.

Now, the question is what kind of properties each dimension in derived nominals has. At this point, it is appropriate to introduce and follow the previous authors’ work for derived nominals. Lebeaux (1986) claims that derived nominals have two readings. One is what he calls Verbal-nominals, and the other is N-nominals. By this, he means that Verbal-nominals denote the original verb meaning, and N-nominals denote the result (or object) reading.

- 55     a. The examination was 8 pages long.  
       b. The examination of the patient took 3 hours.     (Lebeaux, 1986)

The derived nominals in (55a) denote the object (examination paper), while the one in (55b) has the same reading as the original verb (c.f. that somebody examined the patient took three hours). Different interpretations result from the overt existence of argument structure (e.g. “the patient”).<sup>11</sup> The same view is taken by Grimshaw (1990). She distinguishes nominals into three types; result nominals, simple event nominals, and complex event nominals. She claims that only complex event nouns obligatorily take argument structure (Rappaport Hovov and Levin 1992 and Pesetsky 1995). What they do have common is that the existence of the argument structure gives rise to a verbal reading. Following the authors, I adopt this idea of the existence of the argument structure (internal argument of the original verb) to denote the original verbal meaning of derived nominals. Furthermore, I claim that the existence of the argument structure takes derived nominals from concept (Muromatsu’s 1D) to verbal meaning. I call this level as “eventhood”. Then, the eventhood is converted to the substance of the event by measure words. This dimension shows the process of the event. Finally, the process is individuated by classifiers (eventualities are captured by small clauses; sc1 = dimension 1, sc2 = dimension 2, and sc3 = dimension3).



This will explain why data (1) through (3) are grammatical and ungrammatical (here, repeated as 57, 58, and 59)

- 57
- a. John’s knowledge of French is great.
  - b. \*John’s two hours of knowledge of French is great.

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<sup>11</sup> Lebeaux (1986) claims that at LF, the affix “-tion” is raised over the argument structure, which forms the same projection as the verb. This is the reason (49b) has a verbal reading.

- c. \*John's three knowledges of French is great.
- 58 a. The destruction of the house was incomplete.  
 b. (?) There was destruction of the cities for two hours.  
 c. \*There were three destructions of the city.
- 59 a. The discussion of the presidential voting was sufficient.  
 b. There were two hours of discussion of the presidential voting.  
 c. There were seventeen discussions of the presidential voting.

(57) means that the fact that John knows French is great. In other words, the derived nominal “knowledge” denote the verbal meaning of “know”. So, (57a) is fine, but (57b) and (57c) are bad because “knowledge” lacks further dimensions. (58a) and (58b) are fine, but (58c) is not since “destruction” lacks the third dimension. In (59), all sentences are fine since “discussion” has 3 dimensions. The same facts hold for the following Japanese examples.

- 60 a. John-no zyuubun-na furansugo-no kokoroe  
 John-gen sufficient French-gen knowledge  
 “John’s sufficient knowledge of French”
- b. \*John niyoru furansugo no sanzi-kan no kokoroe.  
 John by French gen three hours gen knowledge  
 “John’s three hours of knowledges of French”
- c. \*John niyoru furansugo no zyuunana-kai no kokoroe.  
 John by French gen seventeen cl (times) gen knowledge  
 “John’s seventeen knowledges of French”
- 61 a. John niyoru sono ie no huzyuubunna torikowasi.  
 John by that house gen incomplete destruction

“John’s incompete destruction of the house”

- b. John niyoru sono ie no sanzi-kan no torikowasi.  
John by that house gen three hours-gen destruction  
“John’s three hours of destruction of the house”
- c. \*John niyoru sono ie no zyuunana-kai no torikowasi.  
John by that house gen seventeen cl (times) destruction  
“John’s seventeen destructions of the house”
- 62 a. Daitooryoo no hyoo nituite no zyuubunna hanasiai.  
president gen voting about gen enough discussion  
“the enough discussion about the presidential voting”
- b. Daitooryoo no hyoo nituite no sanzi -kan no hanasiai.  
president gen voting about gen three hours (duration) gen discussion  
“three hours of discussion about the presidential voting”
- c. Daitooryoo no hyoo nituite no zyuunana -kai no hanasiai.  
president gen voting about gen seventeen cl (times) gen discussion  
“the seventeen discussions about the presidential voting”

Thus, the relevant grammaticality is explained in the dimensional view to derived nominals. Derived nominals can be treated in Muromatsu’s system, but the difference is that the 1D concept is converted to eventhood 1D by argument structure. This means that the argument structure functions to take derived nominals to the event-zone, where the original verbal reading is accessible. Common nouns are not taken to eventhood since 1D is converted to 2D by measure words, not argument structure. I claim that derived nominals reside in a different domain from a common noun domain.

### 4.3. Possible Conversion to Common Noun Dimensions

In the previous section, I claimed that derived nominals are converted to eventhood by argument structure. At the very end of the last section, I also claimed that derived nominals and common nouns reside in different domains. In this section, I will show that there are some derived nominals which can be converted to common nouns.

As a starting point, take a look at the English derived nominal “construction”.

63 The construction of the house was incomplete.

The existence of the overt argument structure “the house” licenses the verbal meaning of the derived nominal. However, “construction” can be used as an adjectival as in Muromatsu’s 1D.

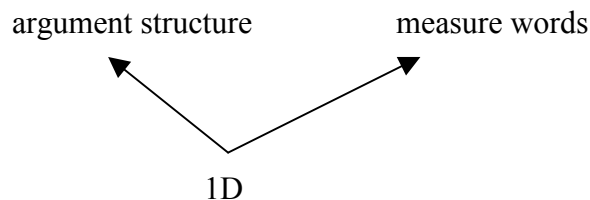
64 That is a construction company.

Also, “construction” can be used as object reading.

65 This construction weighs two tons.

In this example, the meaning of “construction” is shifted to a material meaning, losing the event meaning. Thus, depending on how to convert dimension (either argument structure or measure words), the 1D nominal goes to either the event domain or common noun domain.<sup>12</sup>

66



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<sup>12</sup> Other examples which have both concrete and event reading of derived nominals are: translation, proposal, proof, and explanation. Muromatsu (1995) points out that an event nominal like “work” can go to either event reading or object reading.

## 5. Adjectival Modification and Dimensions

In this section, we will explore how the internal dimensions in derived nominals interact with adjectives. As a starting point, let us observe the treatment of derived nominals by Fu, Borer, and Roeper (1995). According to the authors, derived nominals are formed by syntactic movement. More precisely, a verbal head moves up to nominalizer morpheme to form a word. As a result, they claim that some VP modifiers appear in derived nominals<sup>13</sup>(see 21). Adjectives can modify derived nominals which are formed by syntactic movement. However, their theory doesn't say anything about what kind of adjectives are compatible with derived nominals. Thus, it is plausible to investigate what kind of adjectives are compatible with derived nominals. Take a look at the following examples.

67 John has a complete knowledge of French.

\*careful

\*particular

68 The complete destruction of the paper was observed by John.

careful

\*particular

69 There was a complete discussion of the problem by people.

careful

particular

There is a gradation among adjective + nominal construction. Fu, Borer, and Roeper's approach cannot capture this fact.

To proceed with the investigation, let us review the property of derived nominals and adjectives. In the previous sections, I concluded that derived nominals have internal

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<sup>13</sup> I am not going to discuss why certain VP adverbs appear in this paper. The main reason for not doing so is that my informants disagree with the examples from Fu, Borer, Roeper (1995). Because the judgment isn't clear, I will avoid talking about VP adverbs in derived nominals.

dimensions: eventhood, process, and individuated event. Let us consider “eventhood” more carefully.

To begin with, I would like to adopt the role of adverbs of measurement or degree which modify state (or endstate). Following Parsons’ eventish semantics framework, Tenny (1999) claims that measure adverbs modify the endstate of the core event in the verbs’ lexical meaning. For instance, consider the following sentence.

70 ‘The doctor completely cured the patient’ is true iff  $e[\text{Cul}(e) \wedge \text{Agent}(e, \text{the doctor}) \wedge e'[\text{Cul}(e') \wedge \text{theme}(e', \text{the door}) \wedge \text{CAUSE}(e, e') \wedge s[\text{Being-complete}(\text{cured})(s) \wedge \text{theme}(s, \text{the patient}) \wedge \text{Hold}(s) \wedge \text{BECOME}(e', s)]]]$ <sup>14</sup>

Here, I would like to adopt and extend the measure or degree modifiers in derived nominals to investigate whether or not derived nominals may contain state. In other words, if derived nominals are compatible with degree or measure adjectives, it is plausible to claim that derived nominals also have stative eventuality. This prediction is actually borne out.

71 John has a complete knowledge of French.

72 The complete destruction of the paper was observed by John.

73 There was a complete discussion of the problem by people.

Derived nominals “knowledge”, “destruction”, and “discussion” are compatible with the degree modifier “complete”. It is plausible that these derived nominals are compatible with degree modifiers. “Knowledge” can be considered to “Hold” because people acquire something (say French), and once it is acquired, it holds as knowledge. “Destruction” creates a certain state through the object which is being destroyed as time goes by. “Discussion” is also considered to have state in a situation where there are a couple of agendas to discuss, and as time goes by, some of the agendas are discussed (and

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<sup>14</sup> Tenny’s actual example for event semantics logical form is based on ‘xXclosed the door partway’. Here, I used one of the example sentences in Tenny’s paper. Tenny extends the event semantics analysis to incremental theme verbs to investigate whether or not degree or measure adverbs modify the end-state of the relevant verbs; e.g., X runs a mile partway.

solved). Although the object of “discussion” is different from the one in “destruction” in nature (the object of “destruction” is considered to be affected since in the course of the event, the object is being changed), a certain state can be identified by the end of event. (e.g. a topic is discussed). In an earlier section, I claim that 1D is “eventhood”. Here, I modify the eventuality of 1D. The compatibility of the degree modifier is proof that 1D has stative eventuality.

Next, consider adjectives like “careful” with derived nominals.

74 \*John has a careful knowledge of French.

75 The careful destruction of the paper was observed by John.

(intended reading: the manner of destruction was careful. Thus, the person taking action tries not to make a mess by destroying the paper.)

76 There was a careful discussion of the problem by people.

(intended reading: the manner of discussion was careful so that nobody in the discussion would start fighting or arguing.)

The manner interpretation “careful” cannot be compatible with “knowledge”.

In addition, there is another kind of adjective that is compatible only with “discussion”.

77 \*John has a particular knowledge of French.

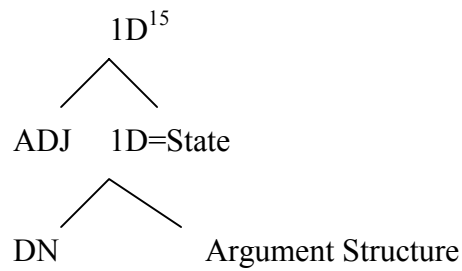
78 \*The particular destruction of the paper was observed by John.

79 There was a particular discussion of the problem by people.

The (in)compatibility of adjectives with different kinds of derived nominals calls for explanation. As we observed at the beginning of this section, the transformational analysis of derived nominals will not capture this fact. I claim that the adjectival modification is sensitive to the internal hierarchy in derived nominals.

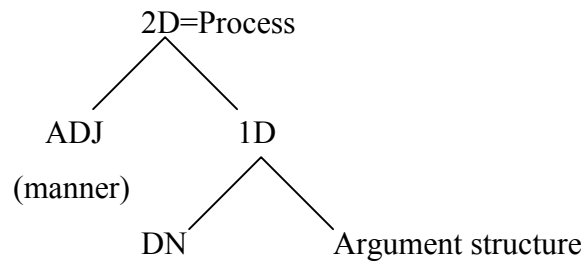
Recall that the examples (71-73) whose derived nominals are compatible with “complete”. What the derived nominals have in common is state 1D. Thus, I claim that the degree adjective “complete” modifies 1D.

80



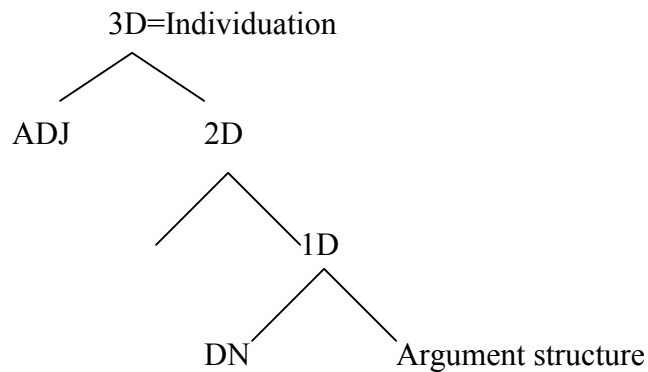
If this line of thought is on the right track, manner adjectives modify 2D (process).

81



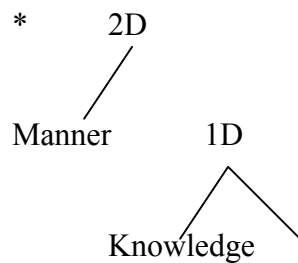
At last, “particular” modifies 3D.

82

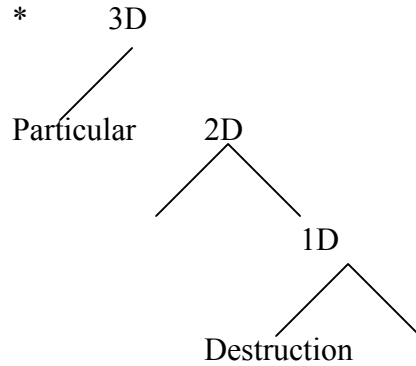


This picture explains why certain types of adjectives are not compatible with derived nominals. Some derived nominals lack the relevant dimensions.

83



<sup>15</sup> In this tree diagram, there are two 1Ds. This does not change dimensionality of the derived nominal.



The compatibility of adjectives with certain derived nominals also supports the view that there may be dimensions in derived nominals, these dimensions corresponding to different eventualities.<sup>16</sup>

## 6. Indication of Events in Clausal and Nominal Level

In this section, we will consider what indicates different eventualities in clausal and nominal (derived nominal) levels. As we discussed in the previous sections, argument structure, measure words, and classifiers convert from lower dimension to higher dimension. Thus, it is plausible to say that argument structure, measure words, and classifiers indicate the different eventualities. Then, the immediate question is what indicates the eventualities in clausal levels. We will explore the answer in this section. To begin with, let us consider what complex events are.

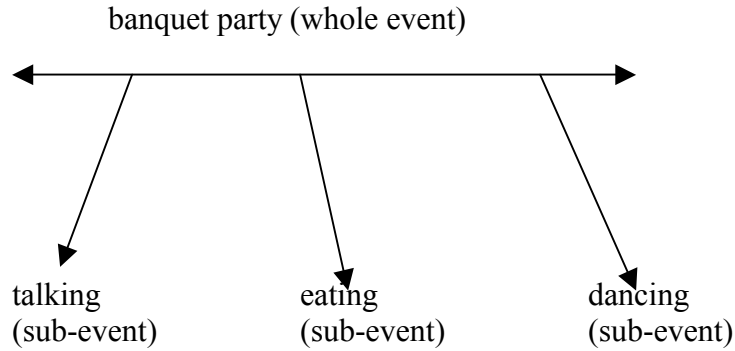
### 6.1. Complex Events

There are two types of complex events. The first one is a big event, which consists of sub-events. Imagine a war or banquet party. On a battlefield, some people shoot, some protect others, and some dig holes. At a banquet party, people eat, talk, or dance. What is common in these events is that they have sub-events (e.g., eating, talking, or dancing). These sub-events interact with one another to make a big event like a war or banquet party. Take a look at the following chart.

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<sup>16</sup> Muromatsu (1998) discusses adjective placement through dimensional theory.

85



In this picture, the whole event (banquet) bears a certain relation to its terminating parts (sub-events).

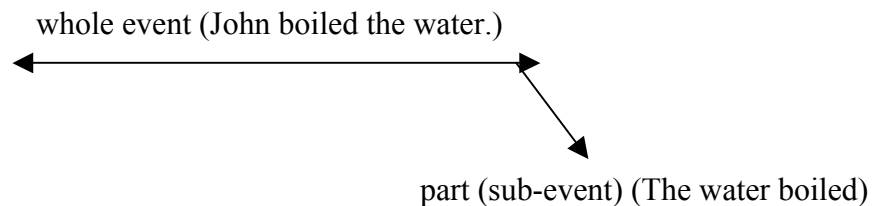
There is another type of event: causal relations over time. Consider the following sentences.

- 86    a. John boiled the water.  
      b. The water boiled.

(Pietroski 1998)

The inference from (86a) to (86b) goes through. (86) can be schematized as follows:

87



What is interesting here is the appearance of the verb “boiled” as transitive and intransitive forms.

Arguing against Fodor and Lepore (1998), Pietroski (1998) argues that the transitive “boil” and intransitive “boil” involve the same lexical item. In other words, the whole event (boiling:transitive) bears a certain relation to its terminating parts (boiling:intransitive).



boiling(intransitive)]. Syntactically, the meta-language is small v, which attracts the movement of the intransitive boiling to make a compound (incorporation). Thus, this view holds a whole-part relation. In this view, small v indicates the existence of sub-events. To be precise, if you boil the water, you need to perform the initial action. The initial action causes the theme “the water” to go through a change of state. At the end of the event, the water is boiled. Each different sub-event can be indicated through the existence of small v (or maybe small s). Thus, not only the flip side of small v in syntax is “terminate-in” in semantics, but also small v indicates the existence of some events in a sentence.

Now, recall Pietroski’s work about the combination of Davidsonian event semantics and Chomsky’s small verb analysis of the transitive verb construction. Small verbs work as an indication of some events in a sentence. A big event terminates in sub-events.

Although it is not precisely the same, small verbs and classifier and mass words play the same role with respect to indicating events. In this sense, sentence and noun phrases have parallel structures.

## **7. Conclusion and Future Research**

In this paper, we found the following:

- 90 Derived nominals have internal dimensions. They are structured as state, process, and individuated event. Each event corresponds to a dimension.
- 91 Some derived nominals have both object and verbal readings. Depending on what kind of dimensional converter (e.g., argument structure or measure word of common nouns) the relevant derived nominal takes, the meanings are changed.
- 92 Adjectival modification also supports the internal dimensions in derived nominals.
- 93 Both small verbs and classifier/mass words work in the same way to indicate events.

However, I did not discuss one fact which current theory cannot resolve. Consider the following sentences:

- 94
- a. There was a huge explosion.
  - b. \*There were four minutes of explosion of the bombs.
  - c. There were seventeen explosions of the bombs.

For some reason, this type of derived nominal does not seem to show a 2D level. This is against dimensional theory, which claims that higher dimensions include lower dimensions. I do not have any account for this class of derived nominals. One thing which may be a plausible answer is that certain types of derived nominals do not show inside, although they may have some internal dimensions. Uriagereka (1998) claims that name is one of the examples. In any event, we will try to resolve this problem in the future.

Future research of dimensions in derived nominals may include possible adverbial placements. Consider the following sentences:

- 95
- a. \*There were four hours of destruction of the cities.
  - b. There was destruction of the cities for four hours.
- 96
- a. There were four hours of discussion of the presidential voting.
  - b. There was discussion of the presidential voting for four hours.

As the examples show, the higher-dimensional word “discussion” gives two possible adverbial placements, while the lower-dimensional word “destruction” gives only one possible site for the adverbial. I take this fact as a reflection of the dimensional view.

I will work on how the positional variation of adverbials is explained from the dimensional view in the future.

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### **Reference**

- Alexiadou, Artemis. (1997). *Adverb Placement. A Case Study in Antisymmetric Syntax*. John Benjamins Publishing Company: Amsterdam.
- Bach, Emmon. (1986). The Algebra of Events. *Linguistics and Philosophy* 9. 1.
- Chomsky, Noam. (1970). Remarks on Nominalization. In Jacobs, Roderick A. and Rosenbaum, Peter. S. *Readings in English Transformational Grammar*. Georgetown University Press: Washington DC.
- \_\_\_\_\_ (1995). *Minimalist Program*. Cambridge: MIT Press.
- Comrie, Bernard, and S.A. Thompson. (1985). Lexical Nominalization. In: Shopen (ed.). *Language Typology and Syntactic Description*. Press Syndicate of the University of Cambridge: New York.
- Davidson, Donald. (1967). The Logical Form of Action Sentences. In: N. Rescher (ed.). *The Logic of Decision and Action* (p.81-95). University of Pittsburgh Press: Pittsburgh. Reprinted in Davidson, *Essays on Action and Events* (105-123).
- Fu, J., H. Borer, and T. Roeper. (1995). The VP within Nominalizations: Evidence from Adverbs and the VP anaphor do-so. MS. University of Massachusetts.
- Higginbotham, James. (1985). On Semantics. *Linguistic Inquiry* 16. 4.
- Higginbotham, James. (2000). On Events in Linguistics Semantics. In: J. Higginbotham, F. Pianesi, and A.C. Varzi (eds.). *Speaking of Events*. London: Oxford University Press.
- Hornstein, N., S. Rosen. and J. Uriagereka. (1994). Integrals. In: J. Nunes (eds.). *University of Maryland Working Papers*. Vol.2. College Park.
- Larson, Richard. (1995). Olga is a beautiful dancer. Paper presented at the winter meetings of the Linguistics Society of America, New Orleans.

- \_\_\_\_\_ (1999). *Semantics of Adjectival Modification*. Lectures at the LOT Winter School. Amsterdam.
- Larson, R. and G. Segal. (1995). *Knowledge of Meaning*. MIT Press: Cambridge.
- Leech, Geoffrey N. (1970). *Towards a Semantic Description of English*. Indiana University Press: Bloomington.
- Lebeaux, David. (1986). The Interpretation of Derived Nominals. In: Farley, A. M. (eds.). *CLS 22*. (p. 231-47).
- Martin, Samuel, E. (1975). *A Reference Grammar of Japanese*. Yale University Press: New Haven.
- Miyamoto, Tadao. (1999). *The Light Verb Construction in Japanese. The Role of the Verbal Noun*. John Benjamins Publishing Company: Amsterdam
- Mori, Nobue. (1996). *Syntactic Representation of Internal Aspect*. MS. University of Maryland.
- Mourelatos, Alexander. P.D. (1981). Events, Process, and States. In: Tedeschi, P. (eds.). *Syntax and Semantics 15*. Academic Press: New York.
- Muromatsu, Keiko. (1995). *Some Notes on Dimensionality in Event Nouns*. MS. University of Maryland.
- \_\_\_\_\_ (1998). *On the Syntax of Classifiers*. University of Maryland Ph.D dissertation
- Parsons, Terence. (1990). *Events in the Semantics of English: A Study in Subatomic Semantics*. MIT Press: Cambridge.
- Pietroski, Paul. (1998a). *Small Verbs, Complex Events: Analyticity without Synonymy*. MS. University of Maryland.
- \_\_\_\_\_ (1998b). Action, Adjuncts, and Agency: *Mind* 107.425.
- \_\_\_\_\_ (2000). *Causing Action*. London: Oxford University Press.
- Rappaport Habov and B. Levin. (1992). –ER Nominals: Implications for the Theory of Argument Structure. In: T. Stowell (eds.). *Syntax and Semantics 26*. Academic Press: New York.
- Tenny, Carol. L. (1999). Core Events and Adverbial Modification. In: Tenny, C. and J. Pustejovsky (eds.). *Events as Grammatical Objects*. Stanford: Center for the Study of Language and Information.

Uriagereka, Juan (1998). A Note on Rigidity. In: Artemis Alexiadou and Chris Wilder (eds.). *Possessors, Predicates, and Movement in the Determiner Phrase*. John Benjamins Publishing Company: Amsterdam.

\_\_\_\_\_ (1999). Warps (Some Thought on Categorization). *Theoretical Linguistics*. Vol. 25. No.1. (p31-73).

Van Haut and T. Roeper. (1998). Events and Aspectual Structure in Derivational Morphology. Papers from the Upenn/MIT Roundtable on Argument structure and Aspect, MIT Working Papers. Vol. 32.

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