Argument Inheritance:
A Level Ordering Approach[*]

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1. Introduction

It has been observed in the morphological literature that deverbal event nominals can inherit the argument structure of their base verbs, as illustrated in (1).

(1) a. John collected stamps.
     b. John's collection of stamps
     c. John's collecting of stamps

Both the derived nominal *collection* in (1b) and the *-ing* nominal *collecting* in (1c) inherit the Agent argument *John* and the Theme argument *stamps* from their base verb *collect(ed)* in (1a).[1]

These two event nominals, however, do not always exhibit parallel inheritance behavior. While they behave alike when their base verbs take two arguments, as shown in (1), their behavior is different when their base verbs take three arguments. Consider (2) and (3).

(2) a. ?/*their drainage of the tank of oil   (Ito 2002: 234)
     b. *John's clearance of the table of dishes

                                               (Pesetsky 1995: 151)
(3) a. their draining of the tank of oil

   b. John's clearing of the table of dishes (Ito 2002: 235)

As the unacceptability of the examples in (2) illustrates, derived nominals cannot inherit the argument structure of three place predicates. In contrast, in the case of *-ing* nominals, argument inheritance is possible even when three arguments are involved, as shown in (3). This indicates that derived nominals are less regular with respect to argument inheritance than *-ing* nominals.

  Interestingly, these two event nominals also behave differently with regard to certain semantic properties. It is well known that derived nominals can also be used as result nominals: they can be interpreted as referring to a result of the event expressed by their base verbs (cf. Grimshaw (1990)). This is illustrated in (4), where *expression* denotes 'what is expressed,' and *assignment* denotes 'what is assigned.'

  (4) a. The expression is desirable.
     b. The assignment is to be avoided. (Grimshaw 1990: 50)

However, this does not hold true for *-ing* nominals. The examples in (5) demonstrate that they cannot generally be used as result nominals.

  (5) a. *The expressing is desirable.
     b. *The assigning is to be avoided.

The discussion above thus raises two questions. They are stated in (6).

  (6) a. Why do derived nominals and *-ing* nominals exhibit different patterns of argument inheritance?
     b. Why do only derived nominals qualify as result nominals?

In what follows, I discuss these questions and provide reasonable answers for

them. Section 2 introduces fundamental theoretical assumptions adopted in this paper. After establishing that morphological processes involve argument inheritance as an intrinsic property, I propose the level ordering hypothesis, suggesting that derived nominals and *-ing* nominals are formed at different levels in the lexical component, as a result of which they are subject to different inheritance mechanisms. In section 3, based on our hypothesis, we investigate what kind of inheritance principle applies at the level where derived nominals are formed. It is argued that an inheritance principle proposed by Nimura (2004) governs the various patterns of argument inheritance observed at the relevant level. Section 4 is devoted to a discussion of question (6b) with the aim of lending additional support to our hypothesis. It is shown that the question receives a natural answer by appealing to the notion of Blocking, which is best captured in the present framework assuming the hierarchical lexical component. Section 5 is a conclusion.

2. Fundamental Assumptions

This section introduces two fundamental theoretical assumptions adopted in this paper by reviewing several previous studies relevant to them. Section 2.1 discusses the first assumption, which is concerned with the notion of inheritance in morphological processes. We argue that inheritance is an intrinsic property of morphological processes by refuting an alternative view, according to which there is no mechanism of inheritance and apparent "inheritance" phenomena are captured by syntactic derivation of deverbal nominals. Section 2.2 deals with the second assumption on the organization of the lexical component. We present the level ordering hypothesis that the lexical component consists of some hierarchically ordered levels and that derived nominals and *-ing* nominals are formed at different levels with different inheritance mechanisms.

2.1. Inheritance as an Intrinsic Property of Morphological Processes

As mentioned above, the main purpose of this paper is to discuss the different patterns of argument inheritance between derived nominals and *-ing* nominals. This presupposes that argument inheritance, however it is characterized, is a formal mechanism contained in the lexical component. Although the notion of inheritance has been widely accepted in the morphological literature (cf. Grimshaw (1990) and Ito and Sugioka (2002), among others), it is necessary to discuss and refute an alternative view of argument realization in deverbal nominals. Of particular relevance here are previous studies that argue against a lexical mechanism such as inheritance by characterizing nominalization as being syntactically governed. Therefore, let us review these studies, pointing out their problems.

Borer (1997), Fu, Roeper and Borer (1995, 2001) and Van Hout and Roeper (1998), among others, independently argue that nominalization can take place in syntax. According to their syntactic approach to nominalization, it applies after at least the VP structures are projected in syntax. Therefore, an underlying structure like (7b) is obtained for the nominal expression in (7a), putting aside technical details.

(7)   a.   the enemy's destruction of the city
       b.   [$_{NP}$ *-ion* [$_{VP}$ the enemy [$_{V'}$ destroy the city]]]

In (7b), the suffix *-ion* is combined with the VP whose head *destroy* projects its subject argument *the enemy* and object argument *the city* as it normally does. If nominalizations contain fully projected VP structures, it straightforwardly follows that arguments are also realized in nominalizations, just as they are realized in the corresponding sentential expressions. This means that the arguments realized with deverbal nominals are the arguments of base verbs rather than those of deverbal nominals themselves.

This kind of syntactic approach that does not appeal to the notion of inheritance is mainly motivated by two pieces of empirical evidence, as well as

by theoretical considerations in favor of a simple picture of overall grammar. Let us review them.

The first piece of empirical evidence comes from the fact that some derived nominals are compatible with VP adverbs, which are generally assumed to be licensed by VP structures. According to Fu, Roeper and Borer (1995), some native speakers accept the following examples, where the derived nominals co-occur with the VP adverbs.

(8)　a.　While removal of evidence purposefully (is a crime), removal of evidence unintentionally (is not).

　　　b.　His explanation of the problem immediately to the tenants (did not prevent a riot).　　(Fu, Roeper and Borer 1995: 8)

These observations would show that nominalizations contain VP structures as their underlying structures.

The second piece of empirical evidence concerns the licensing of the VP anaphor *do so*. Fu, Roeper and Borer (1995) note that nominalizations whose heads are derived nominals can serve as antecedents for *do(ing) so*, as shown in (9).

(9)　a.　His destruction of the documents was preceded by Bill's doing so.

　　　b.　His removal of the garbage in the morning and Sam's doing so in the afternoon was surprising.　　(ibid.: 22)

Given the general assumption that only VP structures can be antecedents for *do so*, (9) can be taken as evidence for the existence of VP structures within nominalizations.

Having illustrated the syntactic approach, let us now consider several problems and argue that it does not undermine our assumption that nominalization is a morphological operation involving argument inheritance.

Let us begin by discussing the adequacy of the data themselves used to argue for the existence of VP structures in nominalizations. First, note that, generally, VP adverbs cannot co-occur with derived nominals, as illustrated in (10).

> (10)   a.   Fred's acceptance of such a menial job (??willingly) means
>   he has little self-esteem.
>   b.   Lucy's performance of *Tzigane* (*beautifully) received
>   thunderous applause.   (McCawley 1988: 409)

Moreover, there does not seem to be agreement in the literature concerning the judgments on (8) and (9) given by Fu, Roeper and Borer (1995). For instance, Alexiadou (2001) claims that the examples in (8) are not acceptable. This is illustrated in (11).

> (11)   a.   ??the removal of evidence purposefully
>   b.   ??the explanation of the problem immediately
>   (Alexiadou 2001: 24)

Ackema and Neeleman (2004) also note that all native speakers they have consulted with reject all examples in (8) and (9) as clearly unacceptable. This suggests that the set of data in (8) and (9) cannot be used as decisive evidence for the syntactic approach.

A question might arise concerning what is responsible for the data in (8) and (9), if they are real. Ackema and Neeleman (2004) point out the possibility that the interpretation of the whole NP is responsible, rather than whether or not its head is deverbal. They argue that if NP can be assigned a verb-like interpretation, it tends to accept VP adverbs and serves as an antecedent for *do so*. To see this, consider their examples in (12).

> (12)   a.   ?[The physicist's Nobel prize so clearly undeservedly]

surprised the academic world.

<div align="right">(Ackema and Neeleman 2004: 22)</div>

b. ?[John and Mary's unexpected balcony scene during dinner] was as badly received as Bill and Sue's doing so during lunch.

<div align="right">(ibid.: 23)</div>

The underived nouns *prize* and *scene* in (12a) and (12b) are used with the VP adverb and *doing so*, respectively. (12a) and (12b), however, are accepted although to a lesser degree. Notice that *Nobel prize* in (12a) is interpreted as 'receiving the Nobel prize,' and that *balcony scene* in (12b) is interpreted as 'playing the balcony scene.' Therefore, Ackema and Neeleman (2004) argue that data such as those in (8) and (9) can be attributed to the fact that derived nominals are likely to gain a verbal interpretation.

  Let us now discuss theoretical difficulties. Recall that argument realization in derived nominals is sensitive to the number of arguments involved. For expository purposes, consider the relevant examples again.

(13) a. the enemy's destruction of the city
      b. *John's clearance of the table of dishes

As the contrast between (13a) and (13b) shows, derived nominals can select two place predicates as their bases, whereas they cannot select three place predicates. Under the syntactic approach, however, nominalization applies after base verbs project their arguments completely. This wrongly predicts that the same number of arguments is realized in both sentences and their related nominalizations. The fact in (13), therefore, remains unexplained under the syntactic approach. This counterargument might not be true of *-ing* nominals since they are basically parallel to their sentential counterparts with regard to argument realization. Another question, however, naturally arises concerning why derived nominals and *-ing* nominals behave differently, because the syntactic approach assumes that both of them contain the same

underlying VP structures. It would be necessary to posit an ad hoc stipulation that some additional device applies exclusively to derived nominals, which would be theoretically undesirable.

It is clear from the discussion above that the syntactic approach to nominalization, where inheritance is not assumed, faces the serious problems. This strongly indicates that this approach does not undermine our assumption that nominalization is a morphological operation involving argument inheritance. Therefore, we assume that inheritance is a formal mechanism contained in the lexical component.

2.2. The Classification of Morphological Processes

Having established that inheritance phenomena must be captured from a morphological point of view, we are now ready to discuss why derived nominals and -*ing* nominals behave differently in inheriting the argument structure of their base verbs. It seems, at first sight, difficult to tackle by appealing to a single inheritance mechanism. Recall that we argued that the VP approach to nominalization cannot account for the different patterns of argument realization between the two types of event nominals, since it wrongly predicts that there is no difference in argument realization between them. The same problem will hold for a lexical approach if it depends on a single inheritance mechanism. For instance, Grimshaw (1990) argues that arguments are inherited when deverbal nominals have the Ev(ent) argument as their external argument (i.e., when they denote an event expressed by their base verbs). The fact that derived nominals and -*ing* nominals are both event nominals, however, indicates that such an approach is insufficient to account for their different inheritance behavior, especially the somehow irregular behavior of derived nominals.

Rather, a more elaborate approach must be sought to account for the different patterns of argument inheritance. It seems that the differences can be attributed to the fact that the two types of event nominals involve different suffixes even though they are semantically similar. Several studies have been
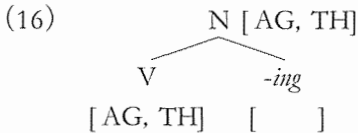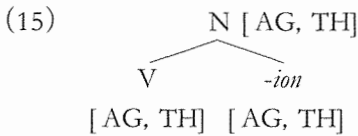
conducted on the classification of suffixes in terms of the inheritance behavior of their derivatives. Some of these previous studies are discussed here since their guiding ideas help us to crystallize our view of argument inheritance.

Roeper (1987) and Shimamura (1990) try to explain various inheritance phenomena by assuming that derivational affixes are classified into three types, as shown in (14).

(14)   a.   Affixes that match the thematic roles on verbs
       b.   Affixes that inherit the thematic roles on verbs
       c.   Affixes that block the thematic roles on verbs

(Roeper 1987: 271)

Particularly important for our discussion is the distinction between (14a) and (14b), because according to them, derived nominals are formed by the affix of type (14a), whereas *-ing* nominals are formed by the affix of type (14b). To illustrate how their inheritance phenomena are captured under this approach, let us consider Roeper's (1987) analysis.
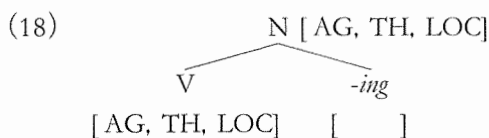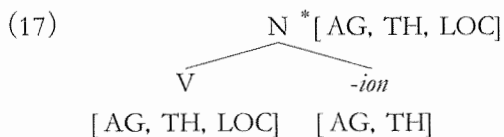
The following internal structures of both nominals suffice to show his fundamental idea.

(15)   N [AG, TH]
              ⎛⎯⎯⎯⎯⎯⎯⎯⎞
             V   *-ion*
          [AG, TH]   [AG, TH]

(16)   N [AG, TH]
              ⎛⎯⎯⎯⎯⎯⎯⎯⎞
             V   *-ing*
          [AG, TH]   [   ]

(15) and (16) are the internal structures of derived nominals and *-ing*

nominals, respectively. Assuming that affixes have their own argument structure, Roeper (1987) claims that the affix *-ion* has its own argument structure [AG (ENT), TH (EME)] and that it must combine with verbs with the same argument structure, namely [AG, TH]. If argument structure matching occurs between the argument structure of *-ion* and that of verbs, derived nominals (i.e. N in (15)) can have the argument structure [AG, TH], as shown in (15). On the other hand, Roeper argues that the affix *-ing* has the empty argument structure, so that the argument structure of verbs is fully inherited, whatever type it is, as shown in (16).

If this analysis is on the right track, it readily follows that derived nominals and *-ing* nominals behave differently when three place predicates are involved. Consider the relevant structures in (17) and (18).

(17)   N *[AG, TH, LOC]
                         _____
                        V   *-ion*
                  [AG, TH, LOC]   [AG, TH]

(18)   N [AG, TH, LOC]
                         _____
                        V   *-ing*
                  [AG, TH, LOC]   [   ]

In (17), the affix *-ion* is attached to the verb whose argument structure is [AG, TH, LOC (ATION)]. However, derived nominals (i.e. N in (17)) cannot have the argument structure [AG, TH, LOC] since the argument structure of *-ion* does not match that of the verb. As shown in (18), on the other hand, the affix *-ing* does not have the specified argument structure. As a result, *-ing* nominals can hold the argument structure of verbs even though it consists of three arguments.

Having illustrated the central content of Roeper's (1987) and Shimamura's (1990) approach, it should be emphasized that derived nominals and *-ing* nominals are regarded as quite different morphological

objects. Given that the affixes *-ion* and *-ing* are the heads of deverbal words, together with the fact that argument structure is lexical information intrinsically specified for lexical items, it is assumed that derived nominals are lexically specified as taking the Agent and Theme arguments. On the other hand, *-ing* nominals are not assigned such a lexical specification, since their argument structure depends completely on the type of argument structure of verbs that are non-head elements.

Recently, Ito (2002) and Ito and Sugioka (2002) have developed a similar idea along the lines of Pinker and Prince (1994), who argue that regular and irregular inflectional processes involve different mental mechanisms.[2] Specifically, Ito (2002) and Ito and Sugioka (2002) claim that *-ing* nominalization is parallel to regular inflectional processes (e.g. *play/played*) and that *-ing* nominals inherit the argument structure of their base verbs without any change or modification, just as inflectional derivatives do. On the other hand, they argue that the formation of derived nominals is similar to irregular inflectional processes (e.g. *drink/drank*), and that derived nominals have their own argument structure independent of that of their related verbs, although how the argument structure of the former is determined is not fully discussed in their studies.

Following the basic idea of these previous studies, let us first assume that derived nominals and *-ing* nominals are intrinsically different morphological objects with respect to argument inheritance. Their approach based on argument structure specifications, however, does not seem to be on the right track. It lacks a principled reason for assuming that a particular specification of argument structure is given to nominalizers; it is difficult to see why derived nominals have the argument structure [AG, TH] , while *-ing* nominals have the empty argument structure. Furthermore, such a lexical specification for affixes itself would not fit in with general economy considerations that favor minimal lexical specifications. Therefore, a more appropriate approach must be explored.

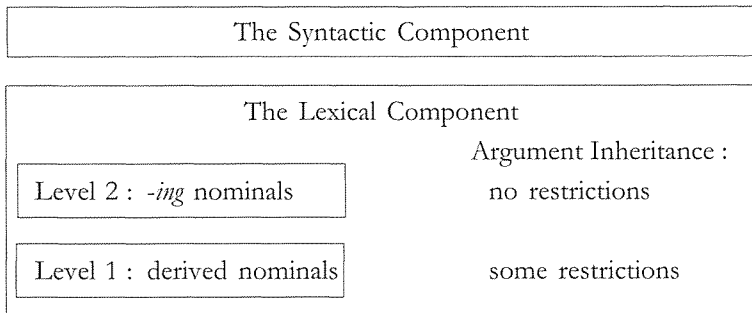An alternative idea to be pursued is that derived nominals and *-ing*

nominals are the outputs of morphological processes taking place in different domains in the lexical component, so that their inheritance behavior is governed by different mechanisms. This idea is based on the framework of Lexical Morphology advocated by Giegerich (1999), Katamba (1993), Kiparsky (1982), and others, according to which the lexical component is hierarchically organized and morphological processes apply at different levels. Irregular derivational processes apply at the first level, Level 1, whereas regular derivational processes apply at the second level, Level 2. This amounts to saying that every derivational affix must belong to either level and that its derivatives must be formed at the level to which it belongs.

Then, at which level are derived nominals and -*ing* nominals formed? Although Lexical Morphology attributes the classification of morphological processes to their phonological, morphological and semantic regularity, a purely word-formational property, it opens up the possibility that there is a regular/irregular dichotomy among morphological processes with respect to their inheritance properties as well, and that such a dichotomy is associated with the levels at which they are formed. Thus, I propose that derived nominals are created at Level 1 since their argument inheritance is irregular, whereas -*ing* nominals are created at Level 2 since their argument inheritance is regular, assuming that there are two levels, putting aside for the moment the possibility that an additional level is needed (see the relevant discussion in section 3.3.).

If this is correct, the next question is where the regularity of argument inheritance comes from. We assume and argue that derived nominals and -*ing* nominals are subject to different inheritance mechanisms that are associated with different levels. This idea is consistent with the traditional view of Lexical Morphology that the phonological properties of affixation are rule-governed; different phonological rules apply at different levels. More specifically, following the basic idea of Roeper (1987), Shimamura (1990), Ito (2002) and Ito and Sugioka (2002) discussed above, I propose that no restriction is imposed on argument inheritance in nominalization taking place

at Level 2; as a result -*ing* nominals are allowed to inherit the argument structure of their base verbs as it is, just as inflectional derivatives are.[3] On the other hand, I propose that there is a certain principle that governs argument inheritance in nominalization taking place at Level 1; consequently, there are some restrictions on argument inheritance in derived nominals according to this principle. Thus, our basic idea is depicted, as in (19), and we call this *the level ordering hypothesis.*

(19)   The Level Ordering Hypothesis (first version):[4]

The Syntactic Component

The Lexical Component	
	Argument Inheritance :
Level 2 : -*ing* nominals	no restrictions
Level 1 : derived nominals	some restrictions

The following sections discuss the adequacy of this hypothesis, trying to show that it is on the right track. The task of section 3 is to examine what kind of inheritance principle applies to Level 1. Section 4 seeks evidence for the existence of these levels by exploring a possible relationship between derived nominals formed at Level 1 and -*ing* nominals formed at Level 2.

3. The Inheritance Principle Based on Thematic Hierarchy

In this section, it is argued that the inheritance principle based on thematic hierarchy proposed by Nimura (2004) is a level-sensitive one that applies to the level where derived nominals are formed. This means that argument inheritance in nominalization taking place at this level is governed by this

principle, as a result of which there are some restrictions on argument inheritance.

3.1. Nimura (2004)

In Nimura (2004), I proposed that the binding function (i.e. the referential function) of a nominalizing suffix plays a key role in accounting for argument inheritance in its nominalization.[5] Specifically, the Thematic Hierarchy in (20) and the Inheritance Principle in (21) were proposed based on an analysis by Randall (1988).

<blockquote>

(20)   Thematic Hierarchy:[6]

Theme > Agent, Event > Instrument, Source, Goal, Path, Location. . .

(21)   Inheritance Principle:

An operation involving a suffix that binds an argument with a θ-role blocks the assignment of the θ-role and all θ-roles lower on the hierarchy.

</blockquote>

(20) and (21) argue that arguments are inherited by a deverbal nominal if they are thematically higher than the argument bound by its nominalizer.

To illustrate how they work, let us consider the inheritance phenomena exhibited by derived nominals in (22) and (23), where derived nominals can inherit the argument structure of two place predicates, while they cannot inherit that of three place predicates.

<blockquote>

(22)   a.   John's collection of stamps

b.   the enemy's destruction of the city

(23)   a.   *John's clearance of the table of dishes

b. ?/*their drainage of the tank of oil

</blockquote>

(24) illustrates the relation between binding and inheritance in (22a).[7]

(24)   John's collection of stamps

Thematic Hierarchy	Theme	>	Event	(> Source)
Binding of *-ion*			bound	
θ-Role Assignment				(blocked)
Inheritance	inherited			(*inherited)

Since *collection* expresses a collecting event, the Event argument of *collect* is assumed to be bound by the suffix *-ion*. Therefore, (20) and (21) guarantee that the assignment of the Theme role is not blocked, because it is thematically higher than the Event role. To put it differently, the Theme argument *stamps* is allowed to be inherited by the derived nominal *collection*, as shown in (24). As a result, (22a) is grammatical.

Let us next turn to (23). (25) illustrates the inheritance mechanism of (23a).

(25)   *John's clearance of the table of dishes

Thematic Hierarchy	Theme	>	Event	>	Source
Binding of *-ion*			bound		
θ-Role Assignment					blocked
Inheritance	inherited				*inherited

The verb *clear* in (23a) has two internal θ-roles that must be obligatorily discharged. One of these θ-roles, namely Source, however, is thematically lower than Event. Therefore, (23a) is ruled out because the derived nominal *clearance* has no ability to assign a θ-role to the Source argument (*of*) *the table*, leading to the failure of its inheritance, as shown in (25).

3.2. Argument Inheritance in *-er* and *-ee* Nominals

Having shown how the inheritance principle proposed by Nimura

(2004) explains the inheritance patterns of derived nominals, we are now in a position to provide support for our present proposal that it is a level-sensitive principle applying at Level 1. If our proposal is correct, an important prediction is made; if there are deverbal nominals formed at the same level as derived nominals, they show parallel inheritance phenomena to those of derived nominals, because all of them should obey the same principle. Therefore, this section is devoted to a discussion of whether or not such nominals exist. If they do and their inheritance behavior can be well handled by the proposed principle, it will provide support for our level ordering hypothesis.

In Nimura (2004), it was shown that *-er* nominals and *-ee* nominals are similar to derived nominals in that their argument inheritance is sensitive to the number of arguments involved and that the principle reviewed above can predict their patterns of argument inheritance as well.

To illustrate this, consider first *-er* nominalizations in (26) and (27).

(26)   a.   an employer of Mary
       b.   a driver of the truck
(27)   a.   *a putter of men on the moon
       b.   *a hander of scalpels to surgeons

As shown in these examples, *-er* nominals can select as their bases two place predicates, but not three place predicates, which shows that the behavior of *-er* nominals is parallel to that of derived nominals. Therefore, basically the same explanation holds for the contrast between (26) and (27) since Agent is in the same rank as Event in the Thematic Hierarchy in (20). Let us consider (26a) and (27a) as illustrative examples. (28) and (29) present the inheritance mechanism of (26a) and (27a), respectively.

(28)   an employer of Mary

Thematic Hierarchy	Theme > Agent
Binding of -er	bound
θ-Role Assignment	
Inheritance	inherited

(29)   *a putter of men on the moon

Thematic Hierarchy	Theme > Agent > Location
Binding of -er	bound
θ-Role Assignment	blocked
Inheritance	inherited *inherited

As shown in (28), if the Agent argument is bound by the suffix -er, the Theme argument *Mary* can be inherited by the resulting nominal *employer*, since Theme is thematically higher than Agent. Therefore, the examples in (26) are grammatical. On the other hand, as shown in (29), if the Agent argument is bound by -er, the Location argument (*on*) *the moon* cannot be inherited, since Location is thematically lower than Agent. Therefore, the examples in (27) are ruled out.

Let us next turn to -ee nominalization. As shown in (30), -ee nominals present the opposite behavior to that of derived nominals and -er nominals observed above.

(30)   a.   *an employee by Mary
       b.   the assignee of homework by the teacher

The example in (30a) indicates that two place predicates cannot serve as the bases for grammatical -ee nominal expressions, whereas (30b) shows that three place predicates can yield grammatical -ee nominal expressions. This

contrast can be accounted for as follows. The suffix *-ee* binds the Theme argument of its base verbs in (30a); *employee* refers to 'one who is employed.' Therefore, the argument inheritance in (30a) is impossible, as illustrated in (31)

(31)   *an employee by Mary

Thematic Hierarchy	Theme > Agent
Binding of *-ee*	bound
θ-Role Assignment	blocked
Inheritance	*inherited

If Theme is bound by *-ee*, the assignment of the Agent role is blocked, because Agent is thematically lower than Theme. Therefore, (30a) is ruled out because the Agent argument *Mary* cannot be inherited by *employee*.

In contrast, the *-ee* nominal *assignee* in (30b) refers to 'one to whom homework is assigned.' In other words, *-ee* binds the Goal argument of its base verbs. Therefore, as shown in (32), such *-ee* nominals are allowed to inherit the Theme and Agent arguments since Theme and Agent are thematically higher than Goal.

(32)   the assignee of homework by the teacher

Thematic Hierarchy	Theme	> Agent	> Goal
Binding of *-ee*			bound
θ-Role Assignment			
Inheritance	inherited	inherited	

Given the discussion above, it can be concluded that the three types of deverbal nominals show somehow irregular inheritance behavior and that their behavior can be accounted for by the proposed principle, as discussed in

Nimura (2004). If this conclusion is recast in terms of the level ordering hypothesis, (20) and (21) will be analyzed as a level-sensitive principle that applies to Level 1, where derived nominals, *-er* nominals and *-ee* nominals are formed. This means that argument inheritance in nominalization taking place at Level 1 is governed by (20) and (21), so that there are some restrictions on argument inheritance at this level.
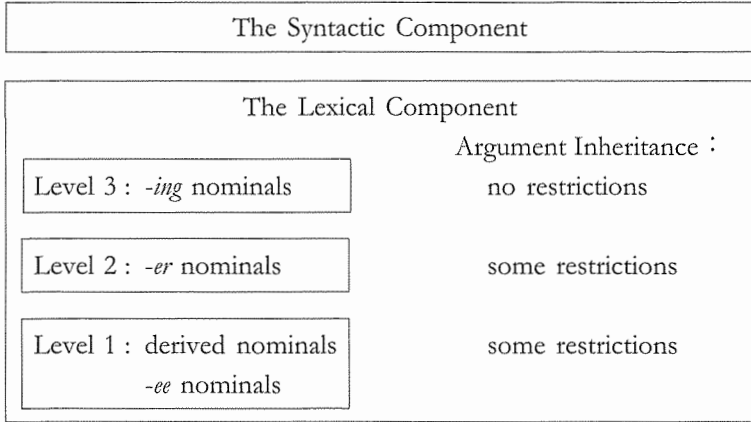
3.3. The Level Ordering Hypothesis Revised

Unfortunately, matters are not so straightforward. Recall that Level 1 is where irregular derivational processes apply. Therefore, one might cast doubt on the proposal that *-er* nominalization takes place at Level 1, since it is generally deemed a regular derivational process, although there seems to be no counterargument to the claim that *-ee* nominals are formed at Level 1. This indicates that *-er* nominalization is a special case in that, while it is regular with respect to word-formational properties (e.g. morphological and phonological properties), it is irregular with respect to inheritance properties.

To accommodate these complicated properties of *-er* nominals into our analysis, let us reconsider the organization of the lexical component. The two-level approach was adopted in section 2, largely because we focused only on *-ing* nominals and derived nominals at that stage. The exact number of levels, however, is still under discussion among researchers. Under the two-level approach, regular derivational and inflectional processes are assumed to take place at the same level, Level 2. Kiparsky (1982), however, proposes that regular inflectional processes and regular derivational processes take place at different levels and that there are three levels in the lexical component.

Following his proposal, let us modify the organization of the lexical component as follows, though the central idea that derived nominals and *-ing* nominals are formed at different levels remains unchanged.

(33)   The Level Ordering Hypothesis:

The Syntactic Component

The Lexical Component

Argument Inheritance :

Level 3 : *-ing* nominals

no restrictions

Level 2 : *-er* nominals

some restrictions

Level 1 : derived nominals *-ee* nominals

some restrictions

This revised level ordering hypothesis proposes that there are three levels in the lexical component, with *-er* nominals formed at the middle level. Specifically, Level 1 is where the formation of derived nominals and *-ee* nominals takes place and some restrictions are imposed on their argument inheritance. At Level 2, *-er* nominals are formed, with some restrictions on their argument inheritance. At Level 3, where there are no restrictions on argument inheritance, *-ing* nominals are formed. Given the organization of the lexical component in (33), we are led to propose that (20) and (21) apply to both Level 1 and Level 2, but not to Level 3.

Note that this proposal on the multi-application of (20) and (21) is not inconsistent with the basic assumptions of Lexical Morphology, since phonological rules or principles are not assumed to belong to one level. They are allowed to apply to two levels if these levels are adjacent. What is required is that each affix belongs to one level. Our proposal does not violate this requirement, and Level 1 and Level 2 are adjacent.

4. The Semantic Ambiguity of Deverbal Nominals and Level Ordering

So far, we have discussed the inheritance phenomena exhibited by derived nominals and *-ing* nominals on the present assumption that they are formed at different levels. We argued that their contrastive inheritance behavior can be attributed to the different mechanisms associated with the different lexical levels. Before concluding this paper, this section briefly examines another type of contrastive behavior between the two types of deverbal nominals to lend additional support to the level ordering hypothesis we have defended.

As mentioned earlier, derived nominals with result readings can be formed productively, while *-ing* counterparts cannot. This raises a natural question of why such a difference is observed, despite the fact that there is no significant difference with respect to the availability of event readings. This question can be given a neat answer by appealing to the notion of Blocking in the sense of Aronoff (1976), the basic idea of which is that the existence of strict synonyms is banned. More specifically, the two deverbal nominals are semantically rival morphological objects, thereby entering into a Blocking relation, which is best captured in the present framework assuming the hierarchical lexical component, as discussed in Nimura (2003).

Our level ordering hypothesis suggests that derived nominals are formed at Level 1 before *-ing* nominals are formed at Level 3. This leads us to claim that the formation of *-ing* nominals with result readings is blocked by the pre-existence of their corresponding derived nominals. For example, the generation of potential *-ing* result nominal **assigning* is blocked by its pre-existing rival derived nominal *assignment*. This Blocking analysis also enables us to account for the existence of apparent counterexamples such as the result nominals *findings* and *writings*. These *-ing* nominals can be created without being blocked because there are no corresponding derived nominals **findation* and **writation*, which stems from the fact that Latinate suffixes such as *-ion* cannot attach to Germanic bases such as *find* and *write*.

Why then are the same Blocking effects not observed when the two types of deverbal nominals have an event reading? This can be attributed to the fact that they have a different event interpretation. Hayase (1996) notes that derived nominals express a telic event, whereas *-ing* nominals express an atelic event, as illustrated in (34).

(34)   a.   the complete withdrawal of Belgian troops
         b.   *?the complete withdrawing of Belgian troops

(Hayase 1996: 256)

The adjective *complete*, which implies result state, can modify the derived nominal *withdrawal* in (34a), but not the *-ing* nominal *withdrawing* in (34b). Given this semantic difference, it can be assumed that the two nominals do not enter into a Blocking relation because they are not rival morphological objects with the same meaning.

These lines of analysis of the semantic problem can be taken as one consequence of assuming that derived nominals and *-ing* nominals are formed at different lexical levels. To the extent that these are on the right track, the proposed level ordering hypothesis receives additional support from the semantic ambiguity of deverbal nominals as well as their inheritance behavior.

5. Conclusion

This paper has defended the level ordering hypothesis by focusing on the different patterns of argument inheritance between derived nominals and *-ing* nominals. The central idea put forth here was that the two nominals are formed at different levels in the lexical component, as a result of which their inheritance behavior is different, depending on the inheritance mechanisms associated with each level. The present study is, of course, insufficient to demonstrate that the hypothesis is empirically correct. A wider investigation of various inheritance phenomena will be left open for future research.

Notes

*   This paper is based on the content of chapters 2 and 3 of my 2005 dissertation submitted to Nagoya University. I would like to express my gratitude to three anonymous reviewers for their valuable comments and suggestions on an earlier version of this paper.

[1]   In this paper, the term "derived nominal" is used as a cover term for deverbal nominals with Latinate suffixes such as *-ion*, *-ment* and *-ance*.

[2]   Pinker and Prince (1994) claim that regular inflection is rule-governed, and therefore, for instance, *walked* is derived from *walk* by some rule without the former listed. On the other hand, they argue that irregular inflection is governed by associative memory and that, for instance, *string* and *strung* are stored as separate, linked words in the lexicon.

[3]   A question might arise concerning the status of the nominal suffix *-ing*: is it a derivational or inflectional suffix? Given its category-changing property, it is plausible to assume that it is a derivational suffix. What is proposed here is that *-ing* nominals involve regular argument inheritance, like inflectional derivatives, not because the relevant suffix is inflectional, but because *-ing* nominals are formed at the same level as inflectional derivatives.

[4]   This organization of the lexical component is modified in section 3.3, where an additional level is assumed for handling certain semi-regular properties of *-er* nominals, although the current hypothesis that derived nominals and *-ing* nominals are formed at different levels remains unchanged.

[5]   As is well known, a nominalizer binds an argument of its base verbs to determine the semantics of its resulting nominals. As illustrated in (i), for instance, the suffix *-er* binds the Agent (or external) argument of its base verbs, while the suffix *-ee* binds the Theme (or internal) argument.

(i)   a. The suffix *-er* binds the x argument (x *employ* y)

   – > *employer* refers to x

   b. The suffix *-ee* binds the y argument (x *employ* y)

   – > *employee* refers to y

[6]   A > B means that A is thematically higher than B. The Thematic Hierarchy proposed here may differ from the standard hierarchy assumed for explaining how arguments are projected in the syntactic structure. For example, Grimshaw (1990: 8) posits the following hierarchy, where Agent is thematically higher

than Theme.

(i)   Agent $>$ Experiencer $>$ Goal, Source, Location $>$ Theme

This implies that different grammatical phenomena involve different thematic hierarchies. The Thematic Hierarchy in (20) indicates that Theme is more prominent than Agent in nominal expressions and that the former argument must be inherited prior to the latter. See Engelhardt (1999) for related discussion where Theme is argued to be more prominent than Agent in nominal expressions in terms of Control theory.

[7]   In what follows, illustrations like (24) are presented for expository purposes, with only the information necessary to explain the grammaticality of the relevant example.

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Synopsis

Argument Inheritance: A Level Ordering Approach
Shinichi Nimura

It has been observed that derived nominals and -*ing* nominals behave differently in inheriting the argument structure of their base verbs, as illustrated in (1) and (2).

(1) a.   John's collection of stamps
     b.   John's collecting of stamps
(2) a.   *John's clearance of the table of dishes

                                                    (Pesetsky 1995: 151)
     b.   John's clearing of the table of dishes   (Ito 2002: 235)

Derived nominals can inherit the argument structure of two place predicates, whereas they cannot inherit that of three place predicates. On the other hand, -*ing* nominals can inherit the argument structure of both types of predicates. This indicates that -*ing* nominals are more regular with respect to argument inheritance than derived nominals.

This paper investigates why these two types of deverbal nominals exhibit the different patterns of argument inheritance. I propose the level ordering hypothesis that they are formed at different levels in the lexical component, as a result of which their inheritance behavior is governed by different mechanisms associated with different levels. More specifically, it is argued that there is a level-sensitive principle that restricts argument inheritance at the level where derived nominals are formed, whereas there are no restrictions on argument inheritance at the level where -*ing* nominals are formed. It is shown that the inheritance principle based on the thematic hierarchy proposed by Nimura (2004) is responsible for inheritance phenomena observed at the level where derived nominals are formed.