

A Constraint-based Approach to English Gerunds

Yong-Beom Kim*[†]
Kwangwoon University

Yong-Beom Kim. 2003. A Constraint-based Approach to English Gerunds. *Language and Information* 7.2, 117–137. This paper attempts to provide an alternative analysis involving categorical issues related to English gerunds. Especially, this paper rejects Maulof's approach that creates a new syntactic category *gerund* by mixing nominal and verbal categories. This paper identifies two syntactic structures in English gerunds: nominal gerunds and verbal gerunds. This distinction is based on syntactic and semantic characteristics of each type and is intended to account for the external distribution and endocentricity of the construction. Treating verbal gerunds syntactically as verbal categories, this paper proposes that English verbal gerunds act like other verbal categories such as infinitives whereas nominal gerunds behaves much like derived nominals. This paper proposes a few lexical rules that can take care of the two types of gerunds. The proposal can be extended to prepositional complements as well as sentential subject positions. This proposal not only resolves the issues involving distributional properties of the gerund construction but also captures syntactic parallelism observable between gerunds and other verbal constructions in English. (Kwangwoon University)

Key words: endocentricity, exocentric, constraint-based, verbal gerund, control, argument-marking preposition, predicational preposition

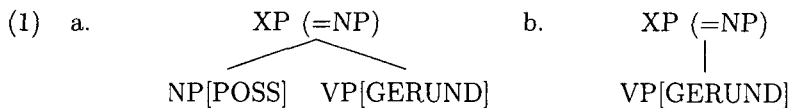
1. Introduction

It is widely known that English gerunds manifest mixed properties of both nominal and verbal categories. The external syntax of verbal gerunds is much like that of

* Department of English Language and Literature, Kwangwoon University, 447-1, Wolgye-dong, Nowon-gu, Seoul 139-701, Korea. e-mail: ybkim@kw.ac.kr

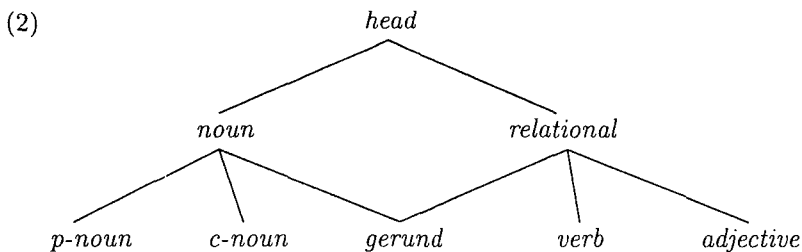
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NPs while their internal structure is more like that of VPs. This two-faced character of English gerunds has been a puzzling problem for generative linguists for long since it would be incompatible with the well-established notion of endocentricity and the X-bar theory if they labeled the topmost gerundive structure as a nominal category while having to construct a verbal structure inside, as shown in (1).



In many analyses XP is labeled as NP or its correlates (see Abney (1987), Pullum (1991), and Wescoat (1994)). If XP gets to be labeled as an NP, however, the structures in (1) violate widely assumed conditions on phrase structure, in that the highest NP lacks a head, and thus the construction is not endocentric. VP cannot be the missing head because it does not have the same categorial feature as the NP. However, as will be reviewed later, there are a few attempts to assign this type of structure for gerunds and they seem to reflect the desperate efforts of linguists to capture the dual characters of the English gerundive construction.

More recently, Malouf (1996, 2000) put forth a more plausible analysis of gerunds by creating a new syntactic category (or *type*) *gerund* on par with verbs, adjective, and common nouns. Thus, on this view, a partial type hierarchy for HEAD¹ values will look like the one in (2) (Malouf 2000: 65).



What is peculiar in (2) is that the gerund category is classified at once as a nominal category and as a relational (predicate) category. As we can see in (2), *gerund* is not a subtype of *verb* but an independent category along with *p-noun* (proper noun) and *c-noun* (common noun) as well as verbs and adjectives. In this paper I will reject Malouf's mixed category approach since such an approach turns out to be unnecessary given the current framework of HPSG (Head-driven Phrase Structure Grammar) as formulated in Pollard and Sag (1994), Sag and Wasow (1999) and Sag et al. (2003). Instead I will treat verbal gerunds syntactically as verbal categories and show that the proposal made in this vein will also avoid the problems involving endocentricity and X-bar conventions. This approach will obviate the need for a new category *gerund* that may create a burden to a grammatical theory.

¹ HEAD features encode various syntactic and semantic information including the categorial status of a linguistic sign in question as well as its features for agreement and morphological forms.

In section 2, I will review Pullum (1991) and Malouf (2000) and discuss some of the shortcomings in their analysis. In section 3, the main ideas of this paper will be presented involving endocentricity and distributional properties of English gerunds. In section 4 some of the analyses of English gerunds will be provided within a constraint-based grammatical framework. Section 5 will summarize the main points of the paper and unresolved problems.

2. Previous Studies

There are many studies on English gerunds such as Abney (1987), Lapointe (1993), Yoon (1996) and so on. These studies have methodological assumptions different from the ones assumed in this paper, however. The three theoretical desiderata proposed in Pullum (1991) are followed in this paper in order to stick to a constraint-based ‘surfacy’ grammatical framework. The first one is ‘strong lexicalism’, which has the effect of treating words as syntactic atoms. So morphemes cannot occupy a syntactic node, nor can syntax manipulate valence of lexemes such as passive lexemes. The second is endocentricity. This principle implies that every constituent has (at least) one distinguished daughter identified as head and the head determines the main syntactic character of the constituent. The third is ‘null licensing’ which is intended to restrain the proliferation of less motivated null categories. Pullum proposes that no phonologically zero constituent should be posited that is neither semantically contentful nor syntactically bound. These theory internal assumptions would prohibit phonologically null heads as proposed in Yoon (1996), for instance.

2.1 Pullum’s (1991) analysis

Pullum (1991) presents a GPSG (Generalized Phrase Structure Grammar) analysis of gerundive constructions that is technically faithful to endocentricity. His analysis is summarized as follows. He posits a Feature Co-occurrence Restriction as shown in (3), which is uncontroversial.

$$(3) [\text{VFORM}] > [\text{V: +}] \& [\text{N: -}]$$

This restriction says that if a category has a feature [VFORM] then it must be verbal categories. In addition to this FCR, he needs a separate ID rule as shown in (4) in order to account for the gerund construction.

$$(4) \text{N}[\text{BAR:2}] \rightarrow (\text{N}[\text{BAR:2}], \text{POSS:+}), \text{H}[\text{VFORM:prp}]$$

The feature [VFORM] specified in the ID rule in (4) collaborates with the FCR in (3) and forces the features [V: +] and [N: -] to be instantiated on the head (i.e., H). Thus, the syntactic tree in (5) is licensed by the coordination of the FCR in (3) and the ID in (4)



However, this may be seen as very unnatural since HEAD Feature Convention plays no role in deciding the major HEAD features. The category NP appears as the mother node as dictated by the ID rule, but the VP, which is a head, emerges as a head daughter not via Head Feature Convention, but due to the FCR in (3). This process is technically possible but it does not have any independent motivation. In other words, the feature specifications in (5) may be called ad hoc since the ID rule in (4) is a kind of unmotivated stipulation in the overall organization of grammar. Generally speaking, [VFORM] should not be instantiated on the head of a noun phrase, but on the head of a verb phrase. In this sense the constructions in (5) may be called exocentric.

Furthermore, Pullum addresses only one subtype of gerundive constructions, i.e., the verbal type, and leaves others unaccounted for. The nominal types shown in (6) are not dealt with within his analysis.²

(6) Nominal Gerunds

- a. Brown's deft painting of his wife is impressive.
- b. The tapping on the floor was very irritating.
- c. John's continuous tapping on the floor annoyed everyone.
- d. There is no difference any more, no checking of passports, ...

(7) Verbal Gerunds

- a. Brown's deftly painting his wife is very impressive.
- b. Mary is well known for singing songs gracefully.
- c. John dislikes Linda trying to tell him a lie.
- d. John was angry at Linda's trying to lie to his brother.
- e. His not having left yet could be a sign of his reluctance.

In addition, the rule in (4) also leaves open the possibility of generating 'pro+gerund' structure by making the possessive NP optional, as in (8) and (9). As is generally agreed in GB style approach or in GPSG approach, NPs (and S') are usually barriers to government and many kinds of semantic construal is blocked by NP or S'. For instance, reflexives or gaps are such cases where the domain of their construal does not contain NP or/and S'. As we can see in (8) the reflexive construal is not blocked when gerunds are involved, as is the case with infinitives. We can see the parallelism between gerunds and infinitives.

- (8) a. I hate overdrinking myself.
 b. I hate to overdrink myself.

² The classification in (6) and (7) are based on the practices done by Quirk et al. (1985: 1290), although the English data are gathered from various sources including Webster's Dictionary web site.

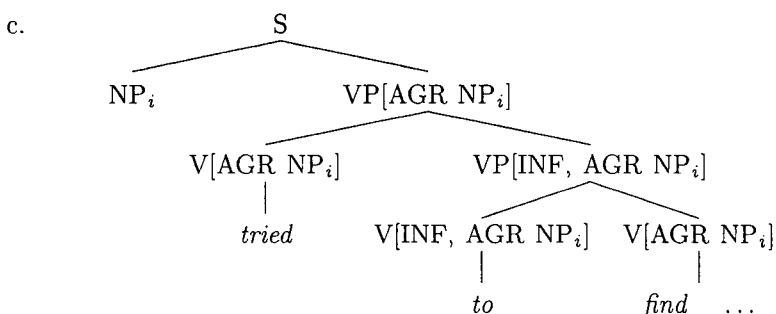
- c. I hate him to overdrink himself.
 d. *I hate him to overdrink myself.
 e. I hate him/his overdrinking himself.
 f. *I hate him/his overdrinking myself.
- (9) a. What do you hate to drink ___?
 b. What do you hate drinking ___?
 c. Which liquor do you hate him to drink ___?
 d. Which liquor do you hate him/his drinking ___?
 e. Who did you see a picture of ___?
 f. *Who did you see the picture of ___?

This seems to indicate that labeling the gerund phrase as NP is not compatible with other parts of grammar, especially with the CAP (Control Agreement Principle) of GPSG since reflexives are accounted for by the CAP and the relevant feature for the CAP is AGR that appears only on verbal path (see Hukari and Levine (1991)).

Examples in (9) also indicate that some NPs, especially definite NPs are islands for extraction. (9d) should not be treated as definite NPs, although Pullum's treatment would force us to label it as a kind of NP.

Furthermore, as was independently pointed out by Malouf, there is a general problem involving control as shown in (10).

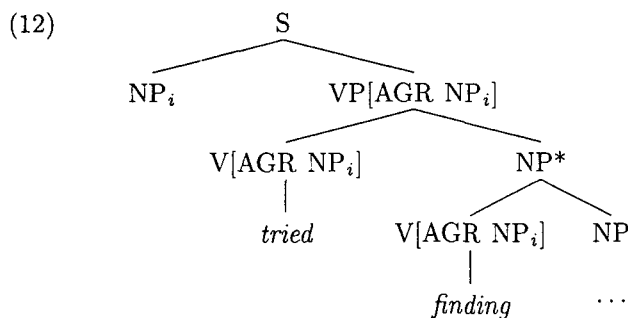
- (10) a. Chris tried to find a Nautilus machine in Paris without success.
 b. Chris tried finding a Nautilus machine in Paris without success.



In both sentences (10a) and (10b), the logical subject of *find* should be coindexed with the subject of *tried*. Since control for infinitival complements should be captured by the Control Agreement Principle and since it is realized through the feature AGR, AGR should appear as shown in (10c). However, because of the FCR shown in (11), if gerundive phrases are treated as nominal categories, the control relation is not captured in gerundive phrases in the grammatical framework of GPSG.

(11) [AGR] \subset [V:+, N:-]

This FCR would block [AGR] from being instantiated on NP* in (12) within Pullum's analysis



To summarize, technically Pullum's NP-analysis may not be seen as problematic with endocentricity. Nevertheless, his approach also seems to raise a problem regarding control in the gerund construction, since *control* is captured by the feature AGR in GPSG and AGR should be instantiated along verbal paths only. However, the mother node of the gerund construction is labeled as an NP as a result of the ID rule in (4), and will be unspecified for AGR. This will block the AGR feature from percolating up or down the path and the control phenomena is unaccounted for if there is no other mechanism devised for this purpose.

2.2 Malouf (1996, 2000)

In this section, Malouf's analysis of English gerunds will be summarized and criticized. The discussions in this section will concentrate on the internal structure of the construction in question and this will be the starting point of my proposal.

2.2.1 Malouf's proposal. Malouf (1996, 2000) tries to solve the problems involving the gerundive construction in a more direct way that may capture the traditional knowledge that English gerunds manifest mixed properties of both nominal and verbal categories. What he does is to declare that gerunds are a descendant of both nominal and relational types in a multiple inheritance type hierarchy of HPSG framework, as shown in (2). He also hinted that there are fuzzy categories as there are fuzzy boundaries in the prototype theory in the cognitive grammar.

This gives the gerund category two kinds of freedom. First, it can occur in a position that is generally occupied by nominal categories in a sentence. This would account for the external distribution of gerunds within a sentence. Second, the above hierarchy would allow gerunds to have the internal structure that verb phrases would normally have due to their *relational* character.

Malouf (2000) needed one more rule for gerunds to inherit the structure of verb phrases and to secure the appropriate morphological form. It is a lexical rule that takes a verb of a present participle form and turns it into a gerund as shown in (13). As we can see in (13), the argument structure of the verb is

preserved, and gerunds can now have an overt specifier unlike present participles thanks to this lexical rule (Malouf 2000: 66).

$$(13) \left[\begin{array}{l} \text{HEAD} \\ \text{VALENCE} \end{array} \left[\begin{array}{l} \text{verb} \\ \text{VFORM } \text{prp} \\ \text{SUBJ } \langle [1]\text{NP} \rangle \\ \text{COMPS } [2] \\ \text{SPR } \langle \rangle \end{array} \right] \right] \Rightarrow \left[\begin{array}{l} \text{HEAD} \\ \text{VALENCE} \end{array} \left[\begin{array}{l} \text{gerund} \\ \text{SUBJ } \langle [1] \rangle \\ \text{COMPS } [2] \\ \text{SPR } \langle [1] \rangle \end{array} \right] \right]$$

Given the type hierarchy in (2), one would normally expect that gerunds would freely inherit nominal features as well as verbal features. For instance, since the new category is a descendant of both nominal and relational categories, the normal expectation would be that the proposal would account for the nominal type in (6) as well as the verbal type in (7).

However, Malouf (2000) does not deal with the nominal type in (6) but limits his analysis to the verbal type. It is a little surprising not to include the nominal type in his treatment, since the hierarchy in (2) seems to imply that the type *gerund* is a subtype of the type *noun*. One natural question to ask is 'why the nominal type of gerund is excluded in his treatment given his proposal that gerunds can in principle inherit properties of both nouns and relationals. This does not seem to have been answered.³

2.2.2 Grammatical Constructions. Malouf states that his approach is construction-based as well as constraint-based. At the first glance, given the hierarchy in (2), gerunds could be viewed as inheriting nominal and relational properties freely. However, gerunds are constrained in a few ways. Otherwise we would not be able to account for the paradigm in (14).

(14) a. Brown's deft painting of his wife is impressive.

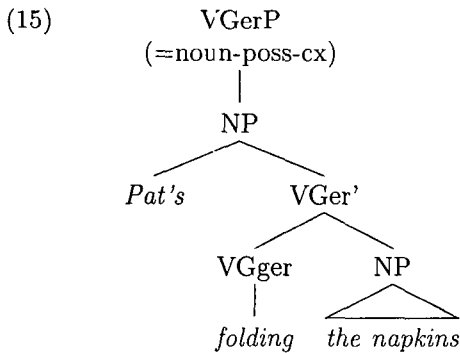
a'. *Brown's deftly painting of his wife is impressive.

³ As one anonymous referee pointed out, my criticism on Malouf's not including nominal gerunds in his treatment may be unjustified since nominal gerunds can be treated as derived nominals, which is actually what is proposed in this paper and in Quirk et al. (1985: 1291). However, my point here is that a more linguistically appealing approach would treat nominal gerunds as a subtype of nouns and verbal gerunds as a subtype of verbs. Here 'linguistically appealing' means 'reflecting or conforming to well-established (traditional) notions of grammar'. In fact, Malouf concentrates more on a few issues involving extraction, quantifier scopes and pied piping in two different types of verbal gerunds, as shown below (Also see Chung et al. (2001) for a fuller discussion and analysis).

- i) Which city do you remember him describing __?
cf. *Which city do you remember his describing __?
- ii) Someone talked about every team's appearing on television (two possible scopes)
cf. Someone talked about every team's appearing on television ('someone' has a wide scope)
- iii) The person whose being late every day Pat didn't like got promoted anyway.
cf. *The person who(m) being late every day Pat didn't like got promoted anyway.

- b. Brown's deftly painting his wife is impressive.
 b'. *Brown's deft painting his wife is impressive.

One way of constraining gerunds is to appeal to constructions. The construction that Malouf makes use of is a *noun-possessive construction* (*noun-poss-cx*) as shown in (15)



As can be seen from the hierarchy in (2), Malouf distinguishes *noun* (non-pronominal nominals) from *c-noun* (common noun) and seems to take care of the paradigm in (14) by appealing to the convention that adjectives modify *c-noun* types, not nouns, and that adverbs modify the *relational* sub-types.

However, as shown in (16), nouns, whether they are proper or common nouns, can be modified by adjectives not only in the usual noun phrases but also in the possessive-noun construction.

- (16) a. John's new job
 b. a new job
 c. in the capitol's cavernous Sejong Cultural Center
 d. Oh, my poor John
 e. my poor French
 f. ancient Palestine

These data seem to indicate that adjectives can modify proper nouns as well as common nouns in various constructions. However, Malouf's hierarchy seems to assume that only *c-nouns* can be modified by adjectives.⁴ Otherwise, there would be no easy way of excluding (16b'). In other words, if gerunds were not classified as subtype of *noun*, we could make a more general statement involving adjectival modification: adjectives can modify the *noun* type in the same manner

⁴ Put another way, the problem involving the data in (14) and the construction in (15) may relate to whether the *noun-poss-cx* can embed a head-modifier construction or not, without any stipulation involving gerunds and its adverbial modifier. If there were no further stipulation, there would be no easy way of admitting (14b) as well-formed and excluding (14b') as ill-formed, since adjectives and adverbs take as MOD value *noun* and *verb* types, respectively.

that adverbs modify the *relational* type. These facts seem to undermine Malouf's proposal that verbal gerunds are a subtype of *noun*.

Furthermore, since the gerundive construction is instantiated in a type of *poss-noun-cx*, the analysis in (15) may suffer from some difficulties that Pullum's analysis may encounter in connection with the data in (8) and (9). In fact, it is not clear whether or not *VgerP* and *Vger'* in (15) is to be considered an opaque domain for such semantic construal as *control* and *binding* since the categories in (15) are brand-new categories..

3. Distributional Properties and Endocentricity

In this section, we summarize some basic fact regarding English gerunds and provide some intuitive ideas for an analysis to be presented in Section 4. Especially, problems involving the distributional properties and endocentricity of English gerunds will be discussed in detail.

3.1 Some Basic Facts of English Gerunds

As pointed out by Pullum (1991), the two types of gerunds have some of the characteristics as shown in (17).

(17) a. Properties unique to verbal gerunds

- can take an ordinary NP objects as complements
- can contain adverbial modifiers
- can contain negating particle *not*
- allow some auxiliaries like 'have'
- The logical subject can be a genitive or an accusative NP

b. Properties unique to nominal gerunds

- can take PP objects as complements
- can contain adjectival modifiers
- contain determiners including *no*
- cannot contains any auxiliaries⁵
- the logical subject can be a genitive NP

⁵ It is impossible to use the 'tense-denoting' auxiliary *have* in the nominal GC, as shown below.

a. *John's (deft) having painted of his dog is a sign of his love for her.

b. *The having tapped on the floor made him exhausted.

Furthermore it is also ungrammatical to use the determiner *no* in verbal GCs.

c. *No/Not. having left yet could be a sign of his reluctance

d. *There is no checking passports (in the sense of 'There is no incidence of checking passports')

As stated in the first section, the distributional properties and categorization of the gerund construction (GC, hereafter) do not seem to respect the traditionally established grammar. For instance, (7b) and (7d), as repeated in (18), could be critical cases if the GCs in these sentences are categorized as a kind of VP since it is usually assumed that verbal categories do not follow a preposition but nominal categories do.

(18) a. Mary is well known for singing songs gracefully. (=7b)

b. John was angry at Linda's trying to lie to his brother. (=7d)

The dilemma lies in the internal syntactic facts involving these GCs that seem to indicate that these may be verbal categories. In this section, I will challenge the assumption that verbal categories do not follow a preposition. In doing so, I will try to preserve the endocentricity fact intact. This approach is different from many previous treatments in that endocentricity is strictly obeyed and no new syntactic categories are created for the purpose of analyzing this construction only.

3.2 Endocentricity in Gerundive Constructions

In this section it will be shown that the endocentricity can be respected within GCs. Assuming a constraint-based grammar we provide a very precise but comprehensive analysis for nominal gerunds and verbal gerunds observing endocentricity of the construction without positing a new category. One of the basic principles in determining the categorical status of GCs is to let the internal properties of a phrase decide the whole syntactic character of the phrase. First consider the examples in (6), as repeated in (19).

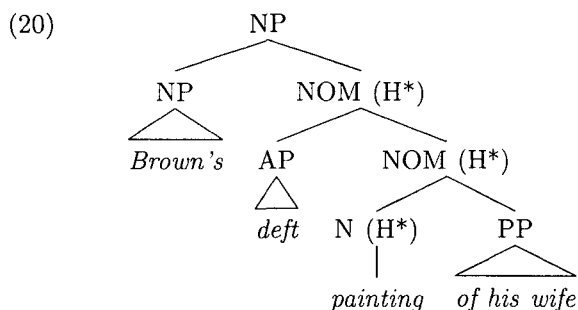
(19) a. Brown's deft painting of his wife is impressive.

a' *Brown's deftly painting of his wife is impressive

b. Brown's deftly painting his wife is impressive.

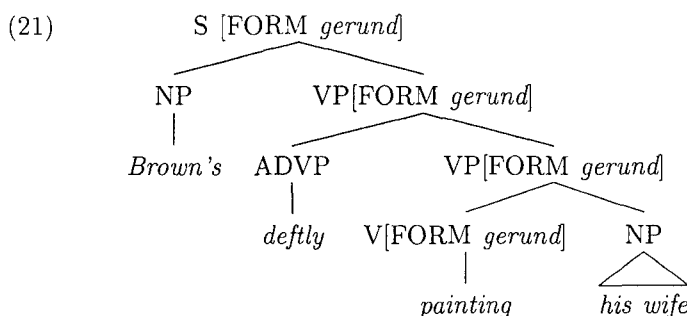
b' *Brown's deft painting his wife is impressive.

There is a significant difference in acceptability between (19a) and (19a'), and between (19b) and (19b'). This disparity in the pattern is taken as one of the main motivations to the taxonomy given in (6) and (7). The gerund in (19a) is considered a nominal type since it has properties that many other nominals have. This type of gerund will be seen as derived nominals, so it will behave like an ordinary noun. For instance, it has an adjective as a modifier and a prepositional phrase as its complement. The relevant structure for (19a) is shown in (20).



In (20), the topmost node is labeled as NP, and its daughter, its granddaughter and its great granddaughter (all marked as H*) can be viewed as sharing the same categorial features with the topmost NP, since they are all nominal categories. The AP will take as its MOD value a *noun* type structure, so it will take a nominal category as its modified head, as is desired. This reveals that the structure in (20) is endocentric. In contrast, (19a') is ungrammatical since an adverb should take a *verb* type as its modified element while other constituents act like nominal dependents.

The same kind of observation can be made as to (19b) and (19b'). We will treat the gerund in (19b) as a subtype of *verb*. We will also assume that *-ing* in the gerund form can be seen intuitively as a lexeme that acts like a complementizer. Although the details of its lexical specification have yet to be provided, we assume that the feature encoding the (complementizer-like) grammatical function should be treated as a HEAD feature. Thus, it will 'percolate up' the structure to the topmost node as shown in (21)



Since S is a kind of verbal category and its head path is maintained down to its lexical head as shown above, we can say endocentricity is obeyed in the analysis shown in (21). What all this indicates is that (19a) is nominal type of gerund and that (19b) is a verbal type and, thus, the structures in (20) and (21) can be viewed as observing endocentricity.

3.3 Distributional Properties of Verbal Gerunds

In dealing with verbal gerunds, many linguists have assumed that gerunds in general, including verbal types, have noun-like properties and that those nominal properties allow gerunds to appear in the subject positions and as complements of

verbs and prepositions. In this section we will challenge this view, claiming that the noun-like distribution of gerunds does not necessarily indicate the noun-ness of gerunds. We will present an argument that some subtype of verbal categories can occur as a subject and as a complement of prepositions as well as that of verbs

First, *to*-infinitives and *that*-clauses are treated as verbal categories in many theories of grammar⁶ but they can appear as the subject and the object of a verb as shown in (22)

- (22) a. To see is to believe
 a'. Seeing is believing
 b. I like to play tennis
 b'. I like playing tennis
 c. That he arrived very early surprised everyone.
 c'. His/Him arriving very early surprised everyone.
 d. No one remembered that he arrived very early.
 d'. No one remembered his/him arriving very early.

As we can see, the subject position is occupied not only by NPs but also by verbal categories. We are not doing justice to gerunds if we treat them as NPs simply because they can occupy the subject position. Verbal categories can occupy argument positions and all the gerunds in (22) can be seen as verbal categories.

Second, some grammatical analyses within such frameworks as GPSG and HPSG treat *whether* and *if* as complementizers, and the clauses or phrases prefixed with these are considered a kind of verbal phrase since the head paths of these phrases are located on the verbal categories throughout. Nevertheless, they can occur as complements of prepositions as shown in (23).⁷

- (23) a. It depends on whether you have the intention to do it or not.
 b. Don't worry about whether you can make up for the financial loss.
 c. We will look into if he'll just send a car to pick us up.
 d. We are not talking about if they get married but when.

The data (23) shows that verbal categories can appear as prepositional complements. That is, some verbal categories can be a complement of a preposition. There is no reason that gerunds cannot appear in those positions as a verbal category.

Third, if *wh*-words initiate a clause as in (24), the clause, which is a verbal category, can follow wide varieties of prepositions.

⁶ See Gazdar et al. (1985) and Pollard and Sag (1994).

⁷ The data in (14c), (14d), and (14d) come from the linguistic corpus Cobuild.

- (24) a. Let me think about what the consequences will be.
 b. There was an argument over who will put the bell on his neck.
 c. Many people got angry at what they had to lose.

The clauses prefixed with *wh*-words in (24) are all verbal clauses in many theories of grammar including GPSG and HPSG, and the examples like (24) can be expanded almost infinitely. This also shows that verbal categories can be a complement of a preposition.

Then the problems of endocentricity and the external syntax of GCs boil down to how to organize grammar so that those restricted types of verbal gerunds can appear in appropriate positions.⁸ Thus, as hinted at in various places in this paper, the nominal GCs in (6) will be treated as derived nouns, so they will follow the nominal syntax, internally or externally. As for the verbal GCs, what we need to do is to revise the specification for the complements of a preposition (and verbs) and also for the subject position, or to devise a way that will capture a general properties of the verbal categories appearing in the argument positions of verbs and prepositions.

4. A Constraint-Based Analysis of English Gerunds

In this section we provide a constraint-based analysis for nominal gerunds and verbal gerunds observing endocentricity of the construction without positing a new category. In section 4.1 nominal gerunds will be accounted in the same way as derived nominals are; in section 4.2 verbal gerunds will be analyzed.

4.1 Syntax of Nominal Gerunds

Since nominal gerunds are treated as derived nouns in this paper, they will follow the syntax of nouns, and we expect that they will show the characteristics of ordinary nouns internally and externally. Bona fide derived nouns like *destruction*, *nationalization*, *donation*, *praise*, etc. can be analyzed as inheriting the argument structure of the root verb lexemes. For instance, consider the data in (25).

- (25) a He donated the money to the children's foundation.
 a' His donation of the money to the children's foundation
 b John praised his daughter for her excellent achievement.

⁸ As two anonymous referees pointed out, if verbal gerunds are simply treated as verbs, it may turn out to be difficult to make a generalization as to what subset of verbal categories appears in a subject or object position, given that *that*-clauses and (for NP) *to*-infinitives can be categorized as CPs. My position, in this paper, is similar to Pollard and Sag's (1994) in that complementizers can be viewed as *markers*. English seems to employ word-level *markers* such as *that* and *for* and a lexeme-level *marker* like *-ing* for gerunds in order to embed one sentential expression into another. Although how to implement this idea into a constraint-based framework is another problem, I temporarily assume that the feature encoding the grammatical function of *-ing* should be among the HEAD features as is the case with many case markers.

- b' John's praise of his daughter for her excellent achievement
 c *John praised her excellent achievement to his daughter
 c' *John's praise of her excellent achievement to his daughter

(25c') sounds awkward since (25c) is ill-formed; (25b') is grammatical because (25b) is well-formed and so on. The same kind of pattern can be expanded to a great extent.

Given the noun-like properties of gerunds mentioned in connection with (19a) and their similarity to the one observed in connection with (25), there seems to be no barrier in positing *gerunds* as derived nominals. This type of derived gerunds can be generated by the lexical rule shown in (26).⁹

(26) Nominal Gerund Lexical Rule

$$\left[\begin{array}{l} d\text{-rule} \\ \text{INPUT } \langle [3], \left[\begin{array}{l} \text{verb-}lxm \\ \text{ARG-ST } \langle \text{NP}_i, [1]\text{NP}_j[\text{MODE } k], \dots \rangle \\ \text{MODE } \text{prop} \end{array} \right] \rangle \\ \text{OUTPUT } \langle \text{F}_{N\text{-GER}}([3]), \left[\begin{array}{l} \text{cn-}lxm \\ \text{ARG-ST } \langle (\text{NP}_i[\text{poss}]), (\text{PP} \left[\begin{array}{l} \text{FORM of} \\ \text{MODE } k \\ \text{INDEX } j \end{array} \right]), \dots \rangle \rangle \\ \text{MODE } \text{ref} \end{array} \right] \rangle \end{array} \right]$$

$\text{F}_{N\text{-GER}}$ in this rule is a set of morphological rules expressed in terms of a function. The preposition that is optionally introduced by this rule will be an *argument-marking* proposition.

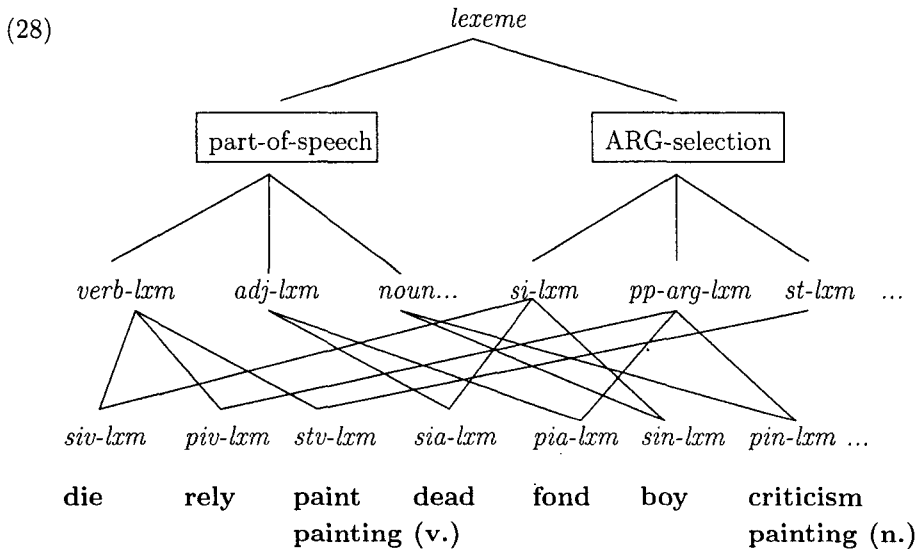
There are also a few more details to be dealt with in order to take care of morphological variations. First, as mentioned before, we will distinguish between nominal gerunds and verbal gerunds. Nominal gerunds are seen as derived nominals and should share some of the lexical features of the root verbs, as shown in (27).

- (27) a Brown's criticism of the book was pretty sarcastic
 a' Brown's painting of his daughter hangs in the town museum.
 b The criticism of the book was pretty sarcastic
 b' The painting of Brown is as skillful as that of Gainsborough.
 c Brown's harsh criticism of the book was expected in advance
 c' Brown's deft painting of his daughter is a delight to watch.

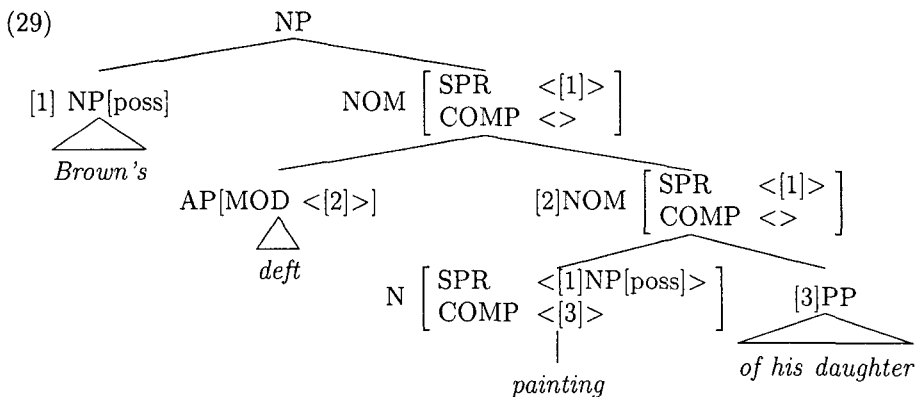
⁹ The lexical rule format in (26) follows the practice of Sag et al. (2003). Thus, PP should have further specifications for AGR-ST, which will contain an NP whose MODE and INDEX values are identical to those of PP's MODE and INDEX, which are omitted for simplicity. For details see Sag et al. (2003: 243).

So the derived nominal can take PP[of] complements which can be an object in ordinary sentential constructions. They can also combine with determiners and adjectives as ordinary nouns do.

Let us demonstrate how derived nominal (and verbal) categories are classified in this approach. Since we are assuming that nominal gerunds belong to nouns and verbal gerunds belong to verbs, the multiple inheritance hierarchy will look like the one in (28).¹⁰



Given this hierarchy, for instance, nominal gerunds originating from transitive verbs are categorized as 'pp-argument-taking' nouns just like *criticism* and they can be preceded by determiners and adjectives, and followed by their complements like ordinary derived nouns, as shown in (29)



¹⁰ In (28) the following abbreviations are used. *siv-lxm* is a shorthand for *strict-intransitive-verb-lexeme*; *piv-lxm* for *prepositional-intransitive-verb-lexeme*; *stv-lxm* for *strict-transitive-verb-lexeme*; *sia-lxm* for *strict-intransitive-adjective-lexeme*; *pia-lxm* for *prepositional-intransitive-adjective-lexeme*; *sin-lxm* for *strict-intransitive-noun-lexeme*; *pin* for *prepositional-intransitive-noun-lexeme*.

The argument-taking properties of nominal gerunds can be accounted for in the same way as the usual derived nouns like *criticism*, *destruction*, *donation*, etc are analyzed. Within this approach the derived gerund nominals are simply argument-taking nouns with a verbal origin.

4.2 Syntax of Verbal Gerunds

Since no separate category is posited for gerunds in this paper, the feature [FORM *ger*] will be introduced to *verb* type in order to distinguish gerunds forms from other verbal forms. This seems to be inevitable since the same form can appear with different combinatory possibilities in different constructions as shown in (30)

- (30) a. We will go on a picnic, the weather permitting.
- b. *We will go on a picnic, the weather's permitting.
- c. I hate Pat smoking heavily.
- d. I hate Pat's smoking heavily.

In other words, we need to separate the gerund construction in (30c) and (30d) from the present participle construction in (30a) and (30b). Present participles do not appear after possessive nominals in any constructions.

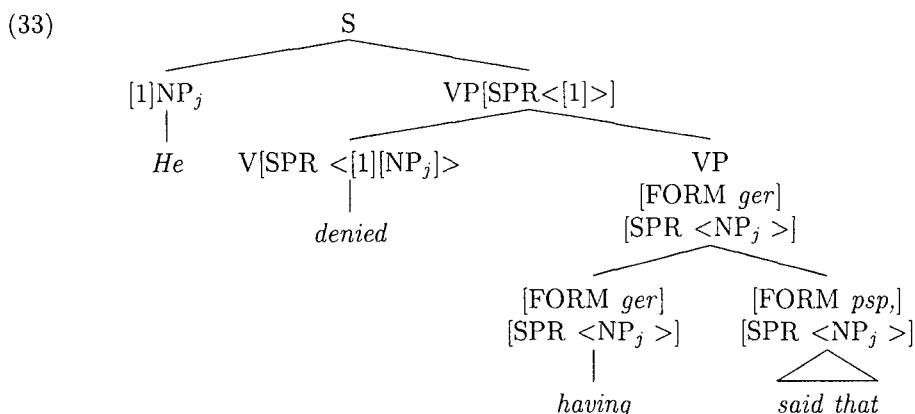
Since verbal gerunds appear in a few coherent patterns, I will adopt the position of Malouf (2000) and Park (2001) who classified verbal gerunds into three types, as shown in (30)

- (31) Verbal Gerunds
 - a. *POSS-ing Gerund* (*I hate Pat's smoking heavily*)
 - b. *ACC-ing Gerund* (*I hate Pat smoking heavily*)
 - c. *PRO-ing Gerund* (*He denied having said that*) (Park 2001: 301)

Based on this taxonomy, this paper will exemplify verbal gerundive constructions in English by employing a lexical rule that generates a gerundive form. The verbs that subcategorizes for PRO-ing gerunds are much like *subject-control* verbs such as *try*, *intend* and so on. Thus, *deny*, for instance, will have a lexical entry as partially shown in (32).

$$(32) \left\langle \text{deny}, \left[\begin{array}{l} \text{HEAD} \quad \left[\begin{array}{l} \textit{verb} \\ \text{AGR}[1] \end{array} \right] \\ \text{VAL} \quad \left[\begin{array}{l} \text{SPR} \quad \langle [\text{AGR}[1]] \rangle \\ \text{COMPS} \quad [2] \end{array} \right] \\ \text{AGR-STR} \quad \langle \text{NP}_i, [2] \left[\begin{array}{l} \textit{verb} \\ \text{HEAD} \quad [\text{FORM } \textit{ger}] \\ \text{SPR} \quad \langle \text{NP}_i \rangle \end{array} \right] \rangle \end{array} \right] \right\rangle$$

The overall tree structure for *He denied having said that* would look like the one in (33)



We will also need a lexical rule for verbal gerunds since verbal gerunds are different from nominal types in crucial ways, although the phonological forms are the same. First, their syntactic features are different from each other. One is nominal; the other is verbal. Second, their complements take on different types and properties. Verbal gerunds will take an obligatory complement of an accusative NP for some verbs while the nominal type can take optional PP complements. These are such crucial differences that any theory that can handle the two types of gerunds should have at least two lexical rules, one for the verbal type and the other for the nominal type. A lexical rule for verbal gerunds is shown in (34), which is similar to the one shown in (26):¹¹

(34) verbal gerund lexical rule

$$\left[\begin{array}{l} i\text{-rule} \\ \text{INPUT} \quad \langle [3], \left[\begin{array}{l} \text{verb-lexm} \\ \text{SEM} \quad \left[\begin{array}{l} \text{RESTR} \quad [A] \end{array} \right] \end{array} \right] \rangle \\ \text{OUTPUT} \quad \langle F_{V\text{-GER}}([3]), \left[\begin{array}{l} \text{HEAD} \quad [\text{FORM ger}] \\ \text{VAL} \quad [\text{SPR} \langle [\text{CASE acc} \vee \text{poss}] \rangle] \\ \text{SEM} \quad [\text{RESTR} \quad [A] \oplus \dots] \end{array} \right] \rangle \end{array} \right]$$

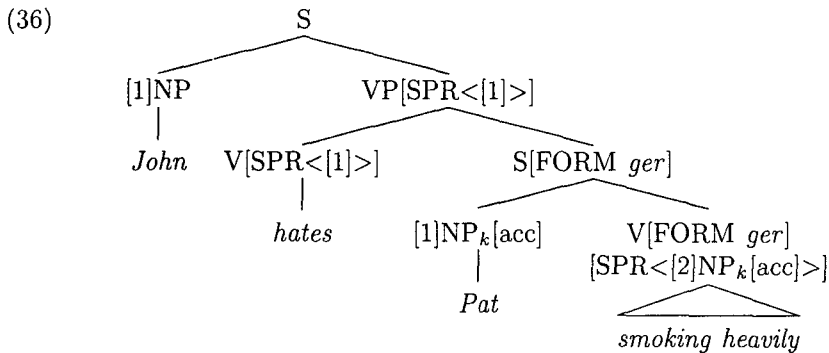
Some verbs like *hate*, *dislike*, etc. take as their complements not only *PRO-ing* gerunds but also *ACC-ing* and *POSS-ing* gerunds. This possibility is given

¹¹ In order to implement the idea suggested in footnote 9, we might include [MARKED *-ing*] (maybe, instead of [FORM *ger*]) among HEAD features of the OUTPUT structure of the lexical rule in (34), which tells that the category is *marked* as *-ing* form. Ordinary complementizers can also be regarded as *marked* elements themselves and pass its feature (i.e., [MARKED *that*] or [MARKED *for*]) to the mother node CP. For instance, [MARKED *that*] may be uniquely specified for *that* in the lexicon and *that* may select a finite S. Like other argument-marking prepositions, it may take linguistically important specifications from its sister and pass them up to the mother. Thus, CPs (and, in general, constituents in the argument positions of a sentence in many languages) may also be seen as *marked* elements. If the mother is *marked*, one of its daughters should be marked since marking can only be realized at the terminal node. In the case of *-ing*, we can assume that the relevant head daughter is *marked* and its specification is passed down to the lexical head where there is no further branching. In the case of lexical markers such as *that* and *for*, marking should occur on the lexical item itself.

in (35).¹²

- (35) a. John hates smoking heavily
- b. John hates Pat's smoking heavily
- c. John hates Pat smoking heavily.

(35c), for instance, is exemplified in (36)



The same pattern can be found with prepositional complements. Consider (37).

- (37) a. I am proud of being a linguist.
- b. I am proud of my wife's being a linguist.
- c. I am proud of my wife being a linguist.

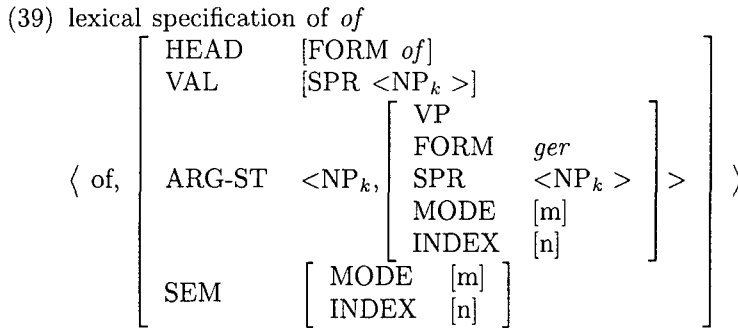
An analysis similar to the one shown in (36) can be provided for the data in (37), although we will have to treat the preposition *of* as an *predicational* and *argument-marking* preposition. Let me illustrate (37a) to see how it can be analyzed. First of all, the partial lexical specification of *proud* can be given, as shown in (38). The lexical specification of *proud* will crucially contain the structure in (38), which is similar to that of a subject control predicate.

$$(38) \left[\text{AGR-STR} \langle \text{NP}_i, [2] \right] \left[\text{SYN} \left[\begin{array}{ll} \text{prep} & \\ \text{HEAD} & [\text{FORM } of] \\ \text{VAL} & [\text{SPR} \langle \text{NP}_i \rangle] \end{array} \right] \right] \rangle$$

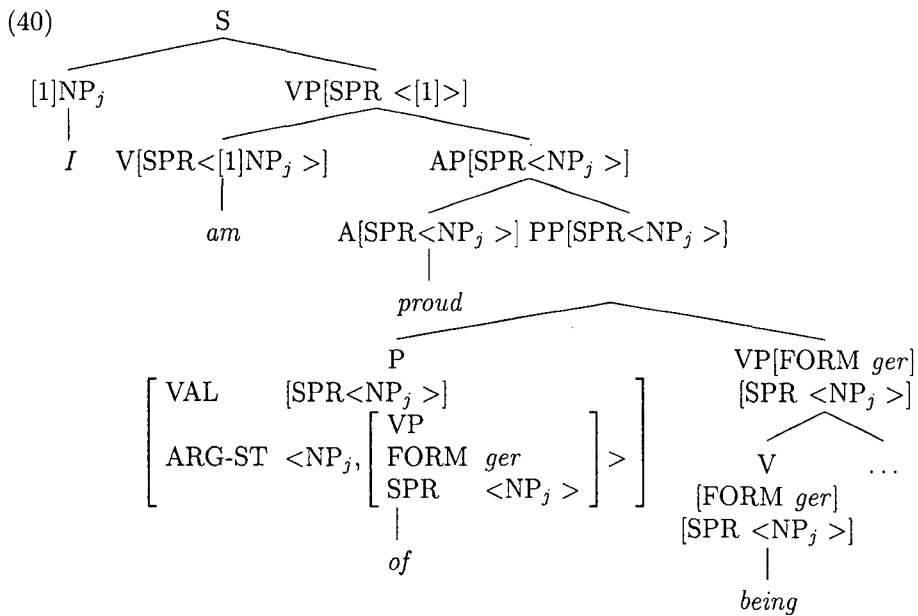
Furthermore, the preposition *of* seems to have dual properties¹³ in (35), although it has a minimal syntactic and semantic function. One is as an argument marker as is the case with *to* in *John talked to himself*. The other is as a transmitter of predication relations as is the case with the infinitival auxiliary *to*. When the preposition takes *PRO-ing* gerunds as its complement, it should behave much like the infinitival auxiliary *to* in order to capture the control relation in (35). Thus *of*

¹² Control in (35a) can be accounted for in an analogous way that the gerund complement of *deny* is dealt with.

will be seen as having the following lexical specification when it takes a gerundive complement.



Given this specification, the overall tree structure for *I am proud of being a linguist* will look like the one in (40)



¹³ This may create a debate as to what motivation is available for positing the inter-bred preposition and also as to how many kinds of prepositions can be posited in English. However, the data like (i) and (ii) seems to indicate that it is an *argument-marking* preposition like *to* in *He talked to himself*. Furthermore the empirical need to capture control in (37a) forces us to treat the preposition as a predicational one as well.

- (i) I am proud of myself.
- (ii) He is fond of himself.

However, it might be possible that *of* in (i) and (ii) (as an argument-marker) is different from *of* in (37a) (as a predicational preposition) and in that case we do not need an interbred preposition

5. Conclusions

This paper has proposed that two types of gerund constructions, nominal and verbal gerunds, should be identified in order to account for various properties of English gerund constructions. We have proposed an HPSG analysis that can capture the fact that verbal categories can function as complements of verbs and prepositions whether they are infinitival or gerundive. One of the main points is that gerunds are not peculiar in their distribution and in their internal structure, so they can observe endocentricity. This proposal solves empirical and theoretical problems of the construction in question in an efficient way in that it can account for the distributional properties of English gerunds, respecting the endocentric nature of the construction without establishing any additional grammatical category.

There are problems that are not dealt with in this paper. They involve various syntactic and semantic differences between ACC-ing gerunds and POSS-ing gerunds (see Abney (1987), Malouf (2000: 33-41) and Chung et al. (2001) for details). I consider those problems will require another full paper. Another problem is how to mark gerund phrases syntactically. Although I suggested a rudimentary idea in footnote 13, it should be tested on other cases like NPs marked with case markers in Korean, Japanese and on other grammatical markers in different languages.

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