Distributional Properties and Endocentricity of English Gerunds

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Abstract

This paper attempts to resolve problems involving distributional properties and endocentricity of English gerund constructions. This paper identifies two syntactic types 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 verb categories, this paper proposes that there are cases of control involving gerunds as in infinitives. Specifically, this paper claims that control is not limited to gerundive complements of verbs but can be extended to prepositional complements. This proposal not only resolves the distributional properties of the gerund construction but also captures syntactic parallelism observable between gerunds and *to*-infinitives in English.

1. Introduction

English gerunds generally manifest nominal properties in their external distribution, but they have verbal characteristics construction-internally. Theses dual properties of the gerund phrases (GPs, hereafter) pose recalcitrant problems with traditionally entertained basic linguistic assumptions such as endocentricity and possible syntactic or lexical categories. The noun-like distribution of gerunds within a sentence necessitates the top node of the phrase to be labeled as a nominal category while the construction-internal aspects of the phrases call for setting up a kind of verbal categories inside. In what follows I will address the above issues based on the taxonomy presented in (1).

(1) <u>Nominal GP</u>
      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, ···

    <u>Verbal GP</u>
      e. Brown's deftly painting his wife is very impressive.
      f. Mary is well known for singing songs (gracefully).
      g. John dislikes Linda trying to tell him a lie.
      h. John was angry at Linda's trying to lie to his brother.
      i. His not having left yet could be a sign of his reluctance.

Many researchers concentrate on verbal type gerunds that are exemplified by (1e-i) and tend to exclude the nominal type listed in (1a) through (1d). This paper will attempt to provide a

comprehensive analysis to the both types of gerunds observing endocnetricity, and will account for the distribution problem without creating a separate syntactic category[1].

As is pointed out by Pullum (1991) and many others, the two types of gerunds have some of the characteristics as shown in (2)

(2) Properties unique to verbal GPs
- · can take an ordinary NP objects as complements   -- (1e), (1f), (1g)
- · can contain adverbial modifiers   -- (1e), (1f), (1i)
- · can contain negating particle *not*   -- (1i)   (cf. (1d))
- · allow some auxiliaries like 'have'   -- (1i)
- · The logical subject can be a genitive or an accusative NP

Properties unique to nominal GPs
- · can take PP objects as complements   -- (1a), (1b), (1c)
- · can contain adjectival modifiers   -- (1c)
- · contain determiners including *no*   -- (1b), (1d)
- · cannot contains any auxiliaries[2]
- · the logical subject can be a genitive NP

2. Distributional Properties and Endocentricity

As stated in the first section, there is difficulty in classifying gerund phrases respecting the pre-established system of grammar. For instance, (1g) and (1h) could be critical cases if the GPs in these sentences are categorized as a kind of VP since it is usually assumed that verbal categories do not follow a preposition distributionally but nominal categories do. The dilemma lies in the internal syntactic facts of these GPs that seem to indicate that these are 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 endocentricity intact. This approach is different from any previous treatments in that endocentricity is strictly obeyed and no new syntactic categories are created for this construction only.

2.1. Endocentricity and Internal Syntax

One basic principle in determining the categorical status of GPs is to let the internal properties of a phrase decide the whole syntactic character of the phrase. First consider the examples in (3).).

(3) a. Brown's deft painting of his wife is impressive. (=1a)
    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.

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[1] See Malouf (1996) who creates a new syntactic categry, i.e., a new *type* in HPSG terms. Also see section 2.1.2. in this paper for the problems of this proposal.

[2] It is impossible to use the 'tense-denoting' auxiliary *have* in the nominal GP, as shown below.

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

*The having tapped on the floor made him exhausted.

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

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

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

There is a significant difference in acceptability between (3a) and (3a'), and between (3b) and (3b'). This disparity in the pattern is taken as one of the main motivations to the taxonomy given in (1). The gerund in (3a) is considered a nominal type since it has properties that many other nominals have. For instance, it has an adjective as a modifier and a prepositional phrase as the complement. On the other hand, (3a') is ungrammatical since an adverb is used where other elements act like nominal dependents. The same kind of observation can be made as to (3b) and (3b'). What all this indicates is that (3a) is nominal type of gerund and that (3b) is a verbal type.

2.2. Previous Studies

Many previous studies on gerund phrases either do not defend endocentricity, or create a new syntactic category, or restrict the analysis to some subtypes of GPs. This paper will attempt to provide a solution to these problems. First we review some of the previous studies in order to single out problems to be dealt with in this paper.

2.2.1 Pullum (1991)

Pullum's (1991) account of GPs is technically faithful to endocentricity, but what equates the head features of the mother node and its daughter is not HFC but FCRs shown in (4).

(4) a. [VFORM] > [V:+]&[N:-]

The feature [VFORM] specified in the ID rule shown in (5) collaborate with the FCR in (4) and forces HEAD features to be instantiated on the head. This is very unnatural since HEAD Feature Convention plays no role in deciding the major HEAD features.

(5) N[BAR:2] --> (N[BAR:2], POSS:+),) H[VFORM:prp]

This rule can generate structures in which an NP appears as the mother node, a VP as a head daughter, and a possessive NP as an optional daughter. Two such cases are shown in (6).

(6) a.　　NP　　　　　　　　　b. NP

　　　　　　/\　　　　　　　　　　　 |
　　　　 /　　\　　　　　　　　　　　|
　　　 /　　　 \　　　　　　　　　　 |

　NP[POSS]　VP [VFORM: prp]　　　VP[VFORM: prp]
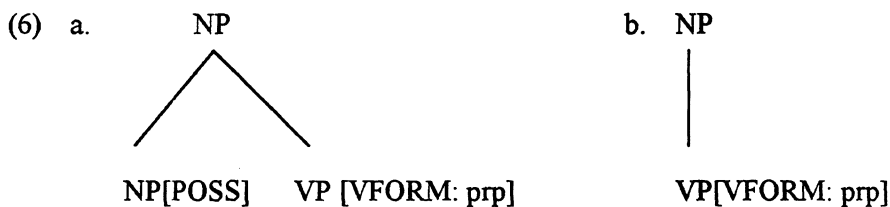
This line of approach may be called ad hoc because [VFORM] is less expected or less motivated in that it is instantiated on the head of a noun phrase, not of a verb phrase.
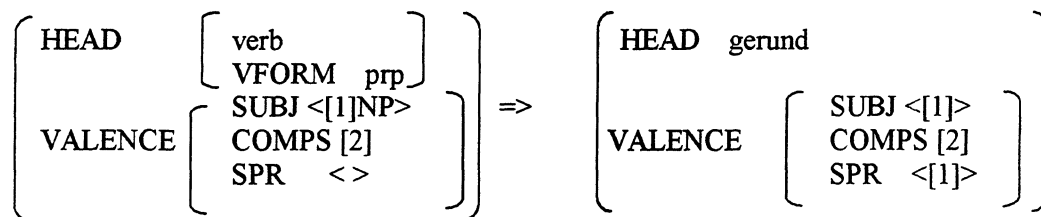
　Furthermore, Pullum addresses only one subtype of gerundive constructions, and leaves other types unaccounted for. For instance, all the nominal types (i.e., the ones in (1a), (1b), (1c), (1d)) and (1g) are not dealt within his analysis. In addition, the rule in (5) also generates 'pro+gerund' structure like (1f) by making the possessive NP optional. This seems to raise a problem regarding control in gerunds, since control is captured by the feature AGR (agreement) in GPSG and it should be distributed along verbal paths only. However, the mother node of the GPs is labeled as an NP as a result of the rule in (5), and is 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.

2.2.2. Malouf (1996)

Malouf (1996) proposes taxonomy of English gerunds similar to the one presented in (1), but he concentrates on the verbal type. Malouf adopts a lexical approach and creates a new syntactic category gerund through a lexical redundancy rule as shown in (7) under the assumption that HEAD values are hierarchically sorted as in (8).
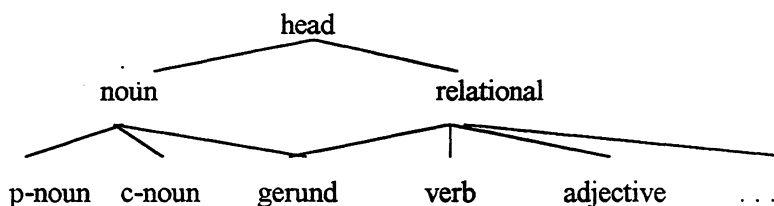
This analysis seems to require a revision of Valence Principle in order to discharge the SUBJ and SPR list simultaneously since the gerund rule, as shown in (7), introduces the two list values, one for SUBJ and one for SPR. Otherwise there would be two occurrences of subject-like expressions.

(7) GERUND lexical rule

$$
\begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{verb} \\ \text{VFORM} \quad \text{prp} \end{bmatrix} \\ \text{VALENCE} & \begin{bmatrix} \text{SUBJ <[1]NP>} \\ \text{COMPS [2]} \\ \text{SPR} \quad <> \end{bmatrix} \end{bmatrix} \Rightarrow \begin{bmatrix} \text{HEAD} \quad \text{gerund} \\ \text{VALENCE} & \begin{bmatrix} \text{SUBJ <[1]>} \\ \text{COMPS [2]} \\ \text{SPR} \quad <[1]> \end{bmatrix} \end{bmatrix}
$$

Furthermore, as shown in (8), since gerunds within Malouf's analysis are both nominal and relational, they could be modified either by adjectives and adverbs.

(8)

```
                        head
                _____/_____
          noun                    relational
       __/\__  _____  _____|_____
      /      \/       \/        |                \
  p-noun   c-noun   gerund     verb           adjective     . . .
```

Within this analysis, the grammar can yield the ungrammatical sentences like (9). Therefore, we can say Malouf's analysis suffers from theoretical and empirical difficulties[3]..

(9) *Brown's deft painting his wife is impressive.
    cf. Brown's deftly painting his wife is impressive (=1e)

3. Internal Syntax of Derived Nominals

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 (10).

(10) 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.
      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

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[3] There are other studies on this problem such as Abney (1987), Lapointe (1993), Yoon (1996), Bresnan (1997), and so on. But these studies have different methodological assumptions than the ones assumed in this paper. So they are not reviewed in this paper. The three theoretical desiderata proposed in Pullum (1991) are followed in this paper. The first principle is 'strong lexicalism' which observes lexical integrity; the second is endocentricity; and the third is 'null licensing' which is intended to restrain the proliferation of less motivated categories. This rule would prohibit phonologically null heads, for instance.

(10c') sounds awkward just as (10c) is ill-formed; (10b') is grammatical since (10b) is well-formed; and so on. The same kind of pattern can be reproduced infinitely.

Given the noun-like properties of gerunds mentioned in connection with (3) and their similarity to the one observed in connection with (10), there seems to be no barrier in positing *gerunds* as derived nominals in the cases like (1a). This type of derived gerunds can be generated by the lexical rule shown below.
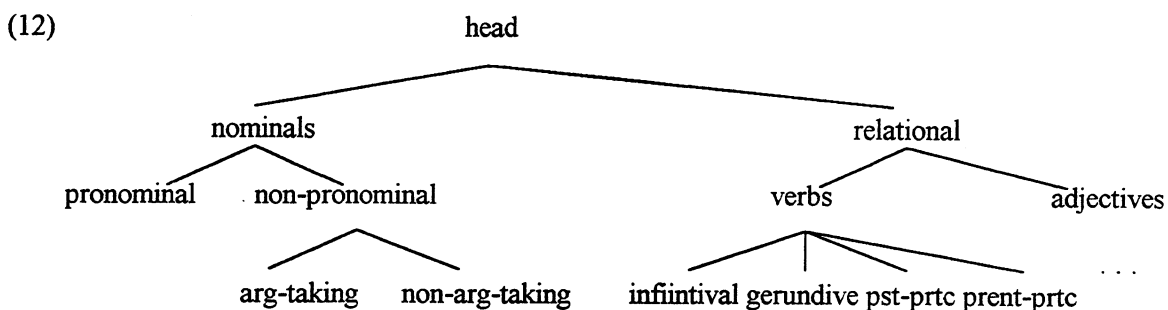
$$(11) < [3], \begin{bmatrix} verb\text{-}lxm \\ \text{ARG-ST} & <NP_i, \ [1]NP, ...> \end{bmatrix} > \Rightarrow$$

$$<\text{F-ing}([3]), \begin{bmatrix} cn\text{-}lxm \\ \text{ARG-ST} <(\text{DetP}([NP_i])), \ (\text{PP} \begin{bmatrix} \text{P-OBJ} \ [1] \\ \text{FORM} \ of \end{bmatrix}) ... > \end{bmatrix}$$

This proposal will, then, naturally lead to another question: is apparently the same form like *painting* sometimes a derived noun and other times a verbal gerund (or some kind of VP)?   There is no harm, theory-internally or empirically, in organizing grammar this way since many derived nominals share the same phonological form with their root lexeme. There are numerous examples of this kind, which are mostly monosyllabic, like *praise, pass, grasp, grab, play, offer*, etc. The remaining problems with this approach would be to explain some GP specific syntax such as the external distribution of verbal GPs, case variations involving the logical subject that we will deal with in the next section. This type of derived nominals can be generated by the usual lexical rule (see Sag and Wasow (1999: 194) for a similar rule, e.g., Agent Nominalization Lexical Rule).

There are also a few details to be dealt with in order to take care of morphological variations. First, we will distinguish between nominal gerunds and verbal gerunds as shown in (1) and (2). Nominal gerunds are seen as derived nominals and inherit some of the lexical features of the root verbs. So the derived nominal can take PP[of] complements that can be an object in ordinary constructions. They can also combine with determiners or specifiers and adjectives as ordinary nouns do. On the other hand verbal gerunds are still a kind of verbs and their forms are determined by the usual grammatical apparatus.

Let us demonstrate how 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 sort hierarchy will look like the one in (12).

(12)

```
                                    head
                    _____/ _____
              nominals                                relational
            __/ \__                                  __/ \__
    pronominal   non-pronominal                verbs        adjectives
                 __/ \__                     __/ | \__
          arg-taking  non-arg-taking   infiintival gerundive pst-prtc prent-prtc   . . .
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Given this hierarchy, for instance, nominal gerunds originating from transitive verbs are categorized as 'argument-taking' nominals and they can be preceded by determiners and followed by their complements like ordinary derived nouns, as shown in (13)

(13) 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.　　(=1c)

The argument-taking properties nominal gerunds can be dealt with in the same way as the usual derived event nouns like *criticism; destruction, donation,* etc are analyzed. Within this approach the derived gerund nominals are simply argument-taking nouns.

4. Distributional Properties of Gerund Phrases

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 distribution of ordinary nouns internally and externally. In dealing with verbal gerunds, moreover, 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 and complement positions of verbs and prepositions. In this section we will challenge this view, claiming that their noun-like distribution is not necessarily licensed by the nominal traits of gerunds. We will present an argument that some subtype of verbal categories can occur as a complement of prepositions as well as of verbs

Many grammatical frameworks like GPSG and HPSG treat *whether* and *if* as complementizers, and 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 resemble noun phrases in their distribution as shown (14)[4].

(14)　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 you'll just send a car to pick us up.

　　　d. We are not talking about if they get married but when.

　　　e. Well, we will need to look at if we're going to be selling

The data (14) shows that verbal categories can be a prepositional complement. That is, verbal categories can be a complement of a preposition.

Furthermore, if wh-words initiate a clause as in (15), the clause can follow wide varieties of prepositions.

(15)　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 (15) are all verbal clauses in many theories of grammar including GPSG and HPSG and the examples like (15) can 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 GPs boil down to how to organize grammar so that those restricted types of verbal gerunds can appear in this slot. We have already stated that the nominal GPs in (1) are to be treated as derived nouns and follow the nominal syntax, internally or externally. As for the verbal GPs, we need to enrich the specification for the complements of a preposition and the logical subject of gerund phrases

5. A Constraint-based Approach

In this section we provide a solution for the problems on the external distribution of GPs by taking rather trivial supplementary measures to the framework of HPSG. One proposal concerns the

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

complement of prepositions and verbs and it also involves capturing the parallelism between gerunds and infinitives. The other has to do with case variation of the logical subject of GPs.

5.1. Complement Positions: a Case of Control

GPs can appear as a sentential subject or the object of a verb. Verbal categories, however, are not new to these positions since those instances (e.g., infinitival and sentential subjects or objects) have already been dealt with and accounted for. One critical location is the positions of complements of prepositions and verbs. In this paper we propose the following lexical specification should be introduced into grammar as shown below.

(16) Lexical Entry for a preposition (or object-control-verb)

$$
\begin{bmatrix}
\text{HEAD} & \textit{preposition (or verb)} \\
\text{COMPS} & <\text{NP}_i, \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb-phrase} \\ \text{Form} & \textit{gernd} \end{bmatrix} \\ \text{SPR} & <(\text{NP}_i)> \end{bmatrix} >
\end{bmatrix}
$$

This specification says that a preposition or a verb can take a control structure in its complement position, i.e., a noun phrase or a verb phrase. This will account for examples like (17a).

(17) a. John is proud of his daughter winning the prize.
      b. John is proud of his daughter.
      c. John is proud of winning the prize.
          Cf. John is proud of his daughter's winning the prize.

The point here is that prepositions can have a control structure as many control verbs do. The same phenomena can be observed in (18a).

(18) a. I remember John leaving his house with a black dog.
      b. I remember John.
      c. I remember leaving his house with a black dog
          Cf. I remember John's leaving his house with the black dog.

The plausibility of this kind of approach can be testified in the other well- studied cases as shown in (19).

(19) a. I like/want him to apply for the position.
      b. I like/want him.
      c. I like/want to apply for the position.
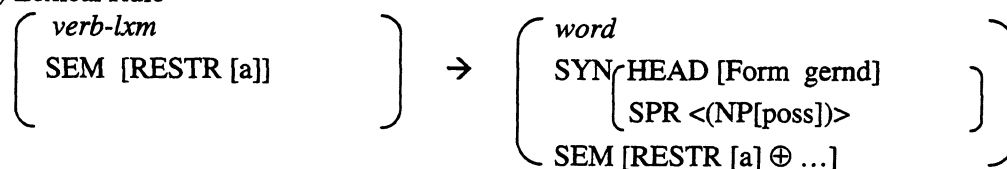   Cf. I like (it) very much for him to apply for the position.

The patterns in (17), (18) and (19) are exactly the same and since we have a mechanism that can handle (19), we can apply the same to (17) and (18) (see Sag and Wasow (1999: 287) for the essentially the same rule dealing with the object control verbs).

5.2. Subjects of Sentential Gerunds

As for one type of logical subject, i.e., accusative one, we have treated it as an object of a preposition or of a verb as in (17) and (18). As for the possessive NP subject, we will treat it as a specifier (or subject) of a sentential gerund. This can provide a clue to the solution for the syntactic and semantic

differences between ACC-ing gerunds and POSS-ing gerunds[5] (See Abney (1987) and Malouf (1996) for details).

(20) Lexical Rule

$$
\left[\begin{array}{l} \textit{verb-lxm} \\ \text{SEM [RESTR [a]]} \end{array}\right] \rightarrow \left[\begin{array}{l} \textit{word} \\ \text{SYN} \left[\begin{array}{l} \text{HEAD [Form gernd]} \\ \text{SPR <(NP[poss])>} \end{array}\right] \\ \text{SEM [RESTR [a]} \oplus \text{...]} \end{array}\right]
$$

Those differences can be accounted for by distinguishing and incorporating those considerations into grammar, and the first step to such distinction would be to appeal to a lexical rule like the following shown in (21).

(21) a. John is angry at (Linda's) having to try to lie to his brother.
   b. I remember John's leaving his house with the black dog.
   c. John's leaving the party early upset Linda.
   d. ?John leaving the party early upset Linda

This rule says that if there is a verbal lexeme, it can license a gerund verb whose optional subject is a possessive NP. This rule is responsible for generating the gerund types in (21). The rule in (21) can be trivially modified to account for (21d) if the awkwardness of (21d) is only a matter of stylistics.

6. Conclusion

This paper has proposed that two types of gerund constructions should be identified in order to account for various properties of English gerund constructions. We have proposed an HPSG analysis that captures the parallelism that are manifested in the infinitival and gerund constructions on one had and nominal and gerund constructions on the other. One of the main points is that gerunds are not peculiar in their distribution, so they can observe endocentricity. The other point is that some prepositions can take control structures as their complements. 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 any ad hoc stipulation.

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[5] One such difference involes extraction from the following gerund phrases.
   Which city do you remember him describing __? /*Which city do you remember his describing __?