Possessive Nominal Expressions in GB: DP vs. NP

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December 8, 2006

1 Introduction

1.1 Background

Since Steven Abney's 1987 MIT dissertation, "The English Noun Phrase in Its Sentential Aspect," the so-called *DP Hypothesis* has gained acceptance in the field of Government and Binding (GB) syntax. This hypothesis proposes that a nominal expression[1] is headed by a determiner that takes a noun phrase as its complement. The preexisting *NP Hypothesis*, on the other hand, diagrams nominal expressions as headed by nouns, sometimes taking a determiner phrase as a specifier.[2] This basic difference is illustrated in the following trees for the nominal expression *the dog*:

The number of different types of nominal expressions that could serve as the basis for an NP vs. DP Hypothesis comparison is naturally quite large, and to address every one would be quite a feat for this squib. I have therefore chosen to concentrate on possessive nominal expressions because they exhibit a certain array of properties that pose challenges for both hypotheses, and will present these according to the following structure:

Section 2.1 (Possessive) nominals posing no problem for either hypothesis

Section 2.2 Problem nominals for the NP Hypothesis

Section 2.3 How the DP Hypothesis accounts for the problem nominals of the NP Hypothesis

Section 2.4 Problem nominals for the DP Hypothesis

Section 2.5 How the NP Hypothesis accounts for the problem nominals of the DP Hypothesis

By "problem nominals," I mean those which expose some weakeness in the ability of either hypothesis to:

1. Conform to the principles of GB selection,

2. Generate only grammatical nominal expressions,

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[1] Nominal expressions, or nominals, are best described as "the types of things that can be subjects."

[2] A note on terminology in this paper: When an element is said to take XP "as a/its specifier," that element may be either a phrase or the head of a phrase, but such will be clear from context and there is no structural difference involved. However, when an element is said to take XP "as a/its complement," said element is the head of a phrase.

3. Avoid inserting elements into a structure that do not exist in the surface form,[3] or

4. Account for all semantic interpretations of the nominal.

The "principles of GB selection" mentioned above are as follows:

GB Selection Heads of phrases can determine...

1. Whether a complement is present,

2. Whether a specifier is present,

3. The syntactic category of the complement/specifier, and

4. Properties of the head of the complement.

To put it colloquially, the GB selection principles guarantee that heads have the only "selectional power" in their phrases. Note that the DP Hypothesis grants such power to determiners, which exert selectional control over the nouns in nominal expressions. In contrast, the NP Hypothesis grants this power to the nouns, which exert selectional control (to some extent, as will be seen) over their determiners.

With these criteria and principles in place, I begin with a few important, hypothesis-neutral observations regarding the nature of possessive nominal expressions, after which I present specific data according to the outline given above and end with a note about the "performance" of each hypothesis.

1.2 Some Possessive Principles

The following observations have relevance to both hypotheses and affect the tree structures for each.

1.2.1 Determiner reference

At first glance, the entity modified by the determiner *the* in the following nominal expression is ambiguous:

(i) the **X**'s **Y** (e.g. *the pig's snout*)

Without additional experimentation, it is difficult to determine whether the initial determiner (*the*) should be syntatically diagrammed as modifying only the posessing entity **X** or the entire description of the possessed entity (**X** *'s* **Y**). These two possibilities are illustrated below:

(ii) [the **X**]'s **Y**

(iii) the [**X**'s **Y**]

To put it simply, in a sentence such as *the barber's friend*, is *the* giving definiteness to *barber* or to *friend* ?

I will attempt to show that this syntactic ambiguity can be resolved by an appeal to semantic felicity. Consider the following nominal expression in which the initial determiner is a possessive pronoun:

(iv) my child's parent

Most English readers would agree that this nominal is self-referential in the absence of a contrived context. That is, if I refer to "my child's parent," I am talking about myself. However, assuming the determiner (*my*) modifies the entire possessed entity (*child's parent*) yields the following interpretation:

1. *my* [*child's parent*] "There exists an entity I consider mine, and this entity happens to be the parent of a child."

This reading conflicts with the naturally-assumed semantic interpretation described above, bringing with it the possibility that the speaker is referring to his/her own parents. Consider the reading that arises when *my* is assumed instead to strictly modify *child*:

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[3] That is, WYSIWYG-ness is optimal and null elements are undesirable.

2. [*my child*]*'s parent* "There exists a parent of an entity, and that entity is a child belonging to me."

The second reading matches the initial semantic assumption, as it makes *parent* coreferential with the speaker. I therefore choose to treat the first determiner in such a nominal expression as modifying the possessing entity instead of the entire possessor-possessed string. In practice, this yields tree structures for both hypotheses in which a string such as *my child* (or, additionally, *my child's*) exists as a constituent of the mother phrase *my child's parent*.

1.2.2   The category & structure of *'s*

Also of relevance to both hypotheses is the syntactic category to be assigned to the possessive marker *'s*. In the previous section, I referred to the possessive pronoun *my* as a determiner, which I support here by noting that *my* seems to be in complementary distribution with obvious determiners:

(v) my table

(vi) * my the table

(vii) * a my table

Observe also that the possessive marker *'s* exhibits the same behavior, appearing to be in complementary distribution with determiners:

(viii) * John's the chair

(ix) * the's chair

(x) * my's chair

Given this evidence, one may conclude that *'s* is a determiner itself, heading its own DP. To flesh out the nature of the *'s* DP, I examine the following examples, which contain incomplete nominal expressions involving *'s*:

(xi) * 's desk

(xii) * Mary's

(xiii) * a dog's

(xiv) * dog's bone

It therefore appears that a nominal expression involving *'s* is ungrammatical without the following elements in their specified order:
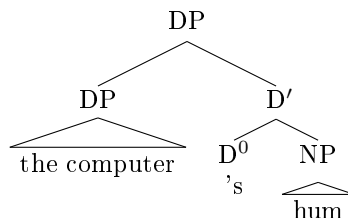
[nominal expression] + ['*s*] + [noun phrase]

This structure is illustrated in the following example:

(xv) [the computer]$_{\text{nom exp}}$ ['s] [hum]$_{\text{NP}}$

Under the DP Hypothesis, these required elements are totally contained within the structure of the *'s* DP, as shown:
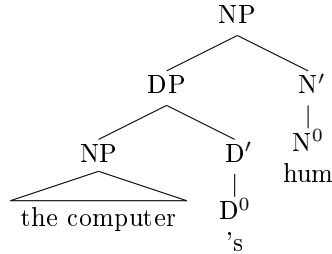
(xv) **DP** the computer's hum

3

The nominal expression DP *the computer* resides as the specifier of the nominal *'s* DP, while the *'s* D heading the DP takes *hum* as its NP complement. Note that this structure grants selectional control in the DP to the determiner *'s*, per the GB selection principles.

The NP Hypothesis incorporates these elements with a slightly different structure:

(xv) **NP** the computer's hum

The nominal expression NP headed by *hum* has as its specifier the *'s*-headed DP *the computer's*, which itself has as its specifier the nominal expression NP *the computer*. In contrast to the DP Hypothesis, this structure grants selectional control in the nominal expression to the noun *hum*.

Each hypothesis, therefore, accommodates the structure of *'s*-nominals in a distinct manner.

2 Data

I will present the following set of possessive nominal expressions under both the DP and NP Hypotheses and make note of the efficacy of their analyses:

Problem-less Nominals

(1) the barber's friend

(2) the man and woman's car

NP Problem Nominals

(3) * a women's rights

DP Problem Nominals

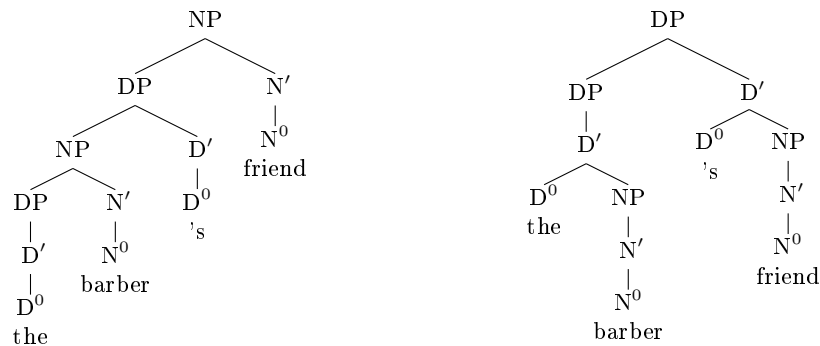**(4)** women's rights

(5) the man's and the woman's cars

2.1 Problem-less Nominals

2.1.1 nominal possessor

(1) the barber's friend

```
            NP                                        DP
          /    \                                    /    \
        DP      N′                                DP       D′
       /  \      |                                 |      /  \
     NP    D′    N⁰                                D′    D⁰   NP
    /  \    |    friend                           /  \   's    |
  DP    N′  D⁰                                   D⁰   NP       N′
   |    |   's                                   the   |       |
   D′   N⁰                                            N′      N⁰
   |    barber                                        |       friend
   D⁰                                                 N⁰
   the                                                barber
```

NP Hypothesis   In this nominal the differences between the two hypotheses are clearly shown. The NP Hypothesis proposes an alternating sequence of NP-DP specifiers: The noun *friend* heads the nominal NP and selects for a DP specifier. This DP specifier is headed by *'s*, which itself requires an NP specifier. Its NP specifier is the phrase *the barber*, headed by the noun *barber*, which selects for the DP specifier headed by *the*, which itself needs no specifier (unlike *'s*).

The most-deeply embedded DP specifier could alternatively be *a, my, her*, etc., yielding *a barber's friend, my barber's friend,* or *her barber's friend.*

The seeming ungainliness of treating *the barber's* as a phrasal constituent can be remedied by noting that *the barber's* is in complementary distribution with accepted DPs, and is therefore a DP itself (c.f. *the friend, my friend, her friend, our friend, a friend, the barber's friend*). Under the NP Hypothesis, a DP cannot stand by itself as a nominal expression, and is taken by some noun heads as a specifier to form a complete nominal expression NP.

DP Hypothesis   The head of the nominal expression in (1) is the determiner *'s*, which requires both a complement and a specifier under the DP Hypothesis. The determiner *'s* takes as its complement the NP headed by *friend* and as its specifier another DP, namely *the barber*. Within the DP *the barber*, *the* is the head and selects for the NP complement headed by *barber*. Similar to the NP Hypothesis, the specifier DP could be headed by either of the determiners *a, my, her*, etc., each of which requires an NP complement and could take the NP *barber*.
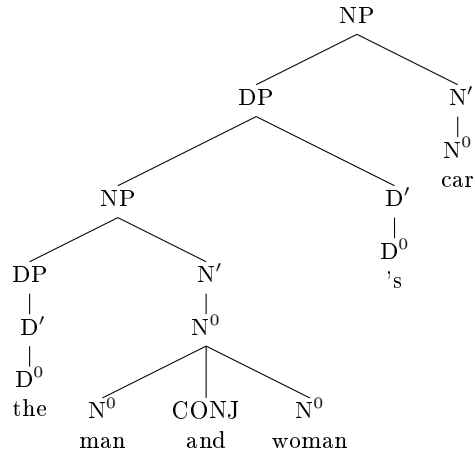
The following table summarizes the selectional properties of each LI in (1):

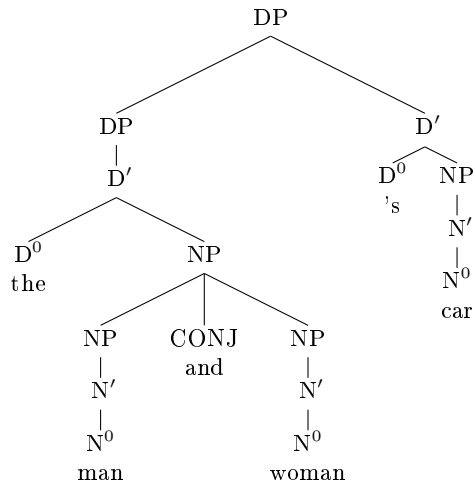| LI	Category	NP Hypothesis	DP Hypothesis
		Selects for:	
the	**D**		NP comp
barber	**N [sg]**	DP spec	
's	**D**	NP spec	DP spec, NP comp
friend	**N [sg]**	DP spec	

2.1.2 coordinated nominal possessors

NP Hypothesis The NP Hypothesis conjoins the nouns *man* and *woman* to instantiate the noun head *man and woman*, which takes a DP specifier headed by *the*:[4]

(2) the man and woman's car

```
                                NP
                      _____/  _____
                     DP                   N′
              _____/  _____            |
            NP                D′          N⁰
        ___/  \___            |           car
       DP         N′          D⁰
       |          |           's
       D′         N⁰
       |       ___/|\___
       D⁰     N⁰  CONJ  N⁰
       the    man  and  woman
```

DP Hypothesis The DP Hypothesis, in contrast, conjoins *man* and *woman* at the NP level to instantiate the NP *man and woman*, which is selected as a complement by the determiner *the*:

(2) the man and woman's car

```
                            DP
                 _____/  _____
                DP                       D′
                |                    ___/  \___
                D′                  D⁰        NP
           ____/  \____             's        |
          D⁰          NP                       N′
          the     ___/|\___                    |
                 NP  CONJ  NP                   N⁰
                 |   and   |                    car
                 N′        N′
                 |         |
                 N⁰        N⁰
                 man      woman
```

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[4]To restate the full pattern of selection for each tree would be redundant, and so I will discontinue the practice here.

The selectional propertes of each element are shown in the following table:

LI	Category	NP Hypothesis	DP Hypothesis
		Selects for:	
the	**D**		NP comp
man	**N [sg]**		
and	**CONJ**	(conjoins two N^0s)	(conjoins two NPs)
woman	**N [sg]**		
's	**D**	NP spec	DP spec, NP comp
car	**N [sg]**	DP spec	

No weaknesses of either hypothesis are exposed by this coordinated posssessive nominal. Although the tertiary branching may cause binary-minded X-bar syntacticians to cringe, this is an issue of the GB framework, not of these hypotheses.

2.2   NP Problem Nominals

The following nominal expression has the same structure as the NP analysis of *the barber's friend* in (1), and yet it is ungrammatical:

(3) * a women's rights
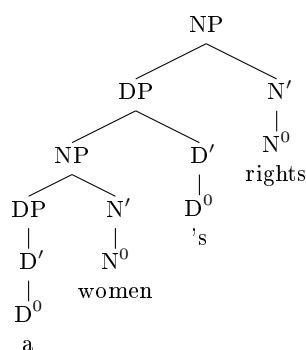
The issue with (3) is that the noun *women*, which heads the possessor NP, can only select for a DP specifier: It has no control over the properties of the head of that specifier, and cannot prevent the DP from being headed by the determiner *a*, which should only appear with singular nouns. The NP Hypothesis, unfortunately, has no mechanism for excluding such ungrammatical nominals without undergenerating: Suppose the claim were made that plural noun heads select for **no specifier**. This would account for the ungrammaticality of (3) and the grammaticality of (3′), but would rule out the grammatical nominal in (3″):

(3) * a women's rights

(3′) women's rights

(3″) the women's rights

Forbidding plural nouns from taking specifiers is therefore an untenable solution. It is tempting, however, to rescue the NP Hypothesis in this situation by modifying the GB principles of selection, granting a head the power to determine certain properties of the head of its **specifier**. This would allow the plural noun *women* to select for a DP specifier headed by any determiner not restricted to singular nouns, preventing the generation of (3) while sanctioning that of (3″). In addition, one could propose that the noun in (3′) is a different version of *women* that takes no specifier.

Syntacticians are naturally (and rightly) loath, however, to drastically alter accepted GB principles simply to tilt the scales in favor of a particular hypothesis. As a result, this selectional problem plagues every plural noun selecting for a DP specifier under the NP Hypothesis.
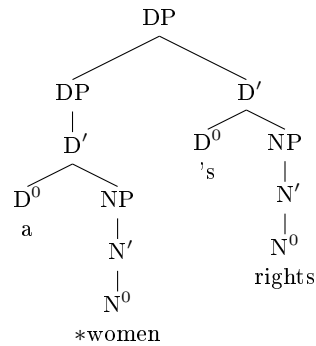
2.3 DP Solution

The DP Hypothesis analysis of (3) prohibits this ungrammatical nominal expression without violating GB selection principles. Consider the table of LIs for (3) under the DP Hypothesis:

LI	Category	DP Hypothesis
		Selects for:
a	**D**	NP comp headed by singular N
women	**N [pl]**	
's	**D**	DP spec, NP comp
rights	**N [pl]**	

The determiner *a* heads its own phrase and selects for an NP complement headed by a singular noun–yet no singular noun exists in the structure:

(3) * a women's rights

```
                        DP
              ┌──────────┴──────────┐
             DP                     D′
              |              ┌───────┴──────┐
             D′             D⁰             NP
        ┌─────┴────┐        's              |
       D⁰         NP                        N′
        a          |                        |
                   N′                       N⁰
                   |                      rights
                   N⁰
                 *women
```

(3) is therefore ungrammatical under the DP Hypothesis because the determiner *a* prohibits the plural noun *women* from heading its NP complement. Hence, the DP Hypothesis trumps the NP in successfully accommodating the GB selection principles.

2.4 DP Problem Nominals

2.4.1 plural possessor

The DP Hypothesis, which so cleanly dispenses with the ungrammatical (3), has some unfortunate problems of its own. Consider the nominal presented previously in (3′) and restated here in (4):

(4) women's rights

As described in Section 1.1, the DP Hypothesis operates by granting the selectional power in a phrase to the determiner. The entire DP is headed by the determiner *'s*, but no determiner head exists in the phrase *women*, which is a constituent of (4). In order to remain consistent with its notion of determiner headship, therefore, the DP analysis of this nominal must insert another determiner into the phrase, which it accomplishes with a null element:

(4) women's rights
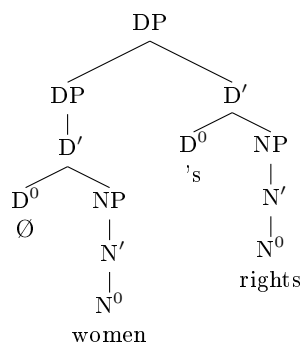
This null determiner takes as its complement the NP headed by *women*. Note it cannot simply take any NP complement, but only those headed by nouns that can "stand alone":

(4) [pl] Ø women's rights (are inalienable.)

(4′) [sg] * Ø woman's rights (are inalienable.)

(4″) [mass] Ø mankind's rights (are inalienable.)

The NPs selected for by the null determiner are headed by mass (*mankind*) or plural (*women*) nouns. These features may be collapsed into a single property called *independent*, allowing one to posit that the null determiner selects for *independent* on the head of its NP complement, a property that all plural and mass nouns bear:

LI	Category	DP Hypothesis
		Selects for:
Ø	**D**	NP comp headed by N bearing property *independent*
women	**N [pl]** **[independent]**	
's	**D**	DP spec, NP comp
rights	**N [pl]** **[independent]**	

While this solution conforms to the GB selection principles, it exposes a serious weakness of the DP Hypothesis: the inability of the analysis to explain a structure without positing an element that does not exist in the surface form (the null determiner).

2.4.2 coordinated possessors, part two

Another problem of the DP Hypothesis is revealed in its analysis of the following coordinated possessive nominal:

(5) the man's and the woman's cars

Note that for (2) (*the man and woman's car*), the DP Hypothesis conjoins *man* and *woman* at the NP level to instantiate the single NP *man and woman*, while the determiner *'s* heads the entire nominal DP. The structure for the nominal in (5), however, is complicated by the presence of two *'s* determiners, both of which require an NP complement, as shown in the following table of selectional properties:

LI	Category	DP Hypothesis
		Selects for:
the	**D**	NP comp
man	**N**	
's	**D**	DP spec, NP comp
and	**CONJ**	
the	**D**	NP comp
woman	**N**	
's	**D**	DP spec, NP comp
cars	**N**	

The NP *cars* must therefore be "shared" between the two *'s* determiners. Structurally, this yields two conjoined DPs, with ellipsis utilized to explain the fact that only one *cars* NP appears in the surface form:
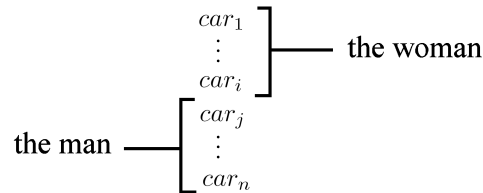
(5) the man's and the woman's car
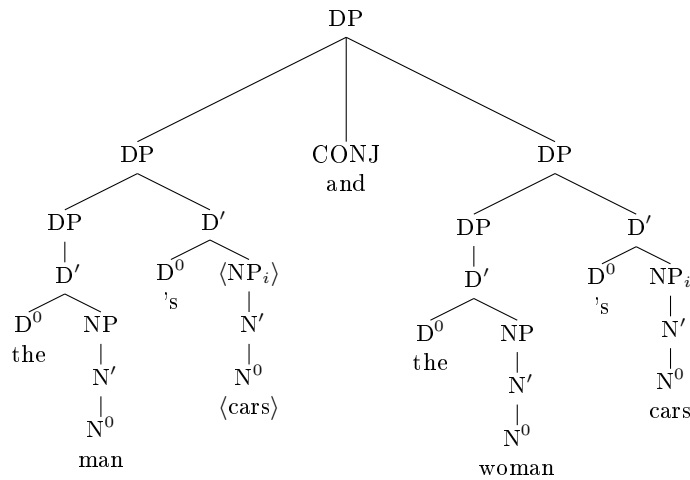
This analysis is burdened by the same problem that plagues (4): The DP Hypothesis must posit an element that does not exist in the surface output, namely the elided NP *cars*.

Notice also that (5) stirs up some interesting semantic issues. When observed in the wild without the lens of either hypothesis, the nominal expression in (5) has these two possible readings:

1. There exists a set of two or more cars, jointly possessed by the man and the woman. This is illustrated in the following conceptual image:
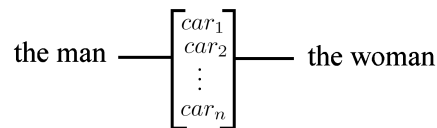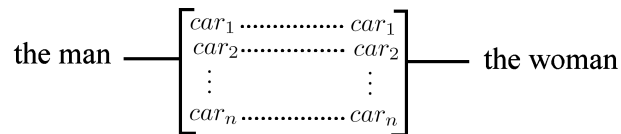
2. Given a set of two or more cars, one subset belongs to the man and the complement subset to the woman:

$$
\text{the man} \rule{1cm}{0.4pt}
\begin{bmatrix}
\begin{array}{c}
car_1 \\
\vdots \\
car_i
\end{array} & \rule{0.5cm}{0.4pt}\ \text{the woman} \\
\begin{array}{c}
car_j \\
\vdots \\
car_n
\end{array} &
\end{bmatrix}
$$

The most natural and real-world use of this interpretation involves a set of exactly two cars, one of which belongs to the man and the other to the woman.
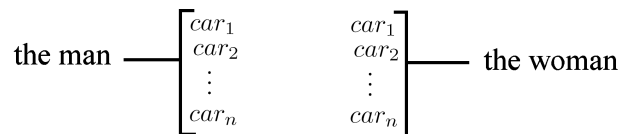
The DP analysis of (5) in the above tree accommodates the first reading by coindexing the two possessed NPs. This results in the interpretation that there exists a set of two or more cars (represented by the leftmost NP *cars*) which **the man** fully possesses, and there also exists a set of two or more cars (represented by the rightmost NP *cars*) which **the woman** fully possesses, and these two sets are actually one single set (represented by coindexing). This reading is equivalent to #1 and is is illustrated by the following figure, in which the horizontal dotted lines depict the coindexing relation:

$$
\text{the man} \rule{1cm}{0.4pt}
\begin{bmatrix}
car_1 \cdots\cdots car_1 \\
car_2 \cdots\cdots car_2 \\
\vdots \qquad \vdots \\
car_n \cdots\cdots car_n
\end{bmatrix}
\rule{1cm}{0.4pt}\ \text{the woman}
$$

"Full" possession is indicated by the presence of each *cars* NP as a separate complement. For example, since *the man's cars* is a single phrasal constituent in the nominal DP, everything to which the NP *cars* refers is possessed by the man: There is no sense in which the man owns only a portion of the set represented by the plural NP *cars*.

Because of this, the DP Hypothesis cannot yield the the second reading: that the man owns a portion of the cars, while the woman owns the rest. Instead, with the coindexing removed, the following reading arises:

The man fully possesses a set of two or more cars, and the woman fully possesses another set of two or more cars:

$$
\text{the man} \rule{1cm}{0.4pt}
\begin{bmatrix}
car_1 \\
car_2 \\
\vdots \\
car_n
\end{bmatrix}
\qquad
\begin{bmatrix}
car_1 \\
car_2 \\
\vdots \\
car_n
\end{bmatrix}
\rule{1cm}{0.4pt}\ \text{the woman}
$$

The analysis is unable to "extract" a subset of cars from the NP *cars* to become a complement in the DP *the man's* and leave the remaining set of cars as a complement in the DP *the woman's*. Because of this inadequacy, the DP analysis fails to account for both possible semantic interpretations of (5).

2.5 NP Solution

The NP Hypothesis, on the other hand, accounts for the two problem nominals of the DP Hypothesis with greater ease.

2.5.1 plural possessor

The DP analysis of (4) is burdened by its introduction of a null determiner that selects for the NP *women*, since it analyzes every nominal expressions as headed by a **determiner**.

(4) women's rights

The NP Hypothesis, however, circumvents this problem altogether by granting headship to a **noun** in each nominal expression, which consequently has the power to select for the presence of a determiner-headed specifier.

The plural noun *women* has two versions: one that selects for a DP specifier, and one that disallows a specifier. The noun head in (4) is the version of *women* that **does not** take a DP specifier, as shown in the table of selectional properties:

LI	Category	NP Hypothesis
		Selects for:
women	**N [pl]**	**no** spec
's	**D**	NP spec
rights	**N [pl]**	DP spec

Note that the noun *rights*, which heads the entire nominal expression, is also plural and could exist without a specifier, but which in (4) manifests itself as the version that selects for a DP specifier.

These selectional properties yield the following tree:
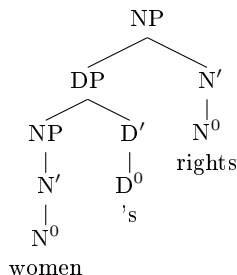
The noun *women* selects for no specifier, and thus the NP Hypothesis here trumps the DP by avoiding the introduction of such non-surface elements as null determiners into the tree structure.
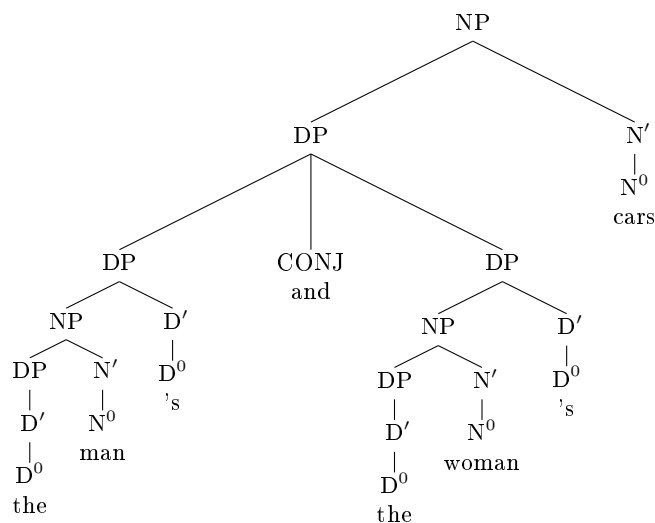
2.5.2 coordinated possessors, part two revisited

The DP Hypothesis analysis of (5) resorts to ellipsis and cannot account for both semantic interpretations of the nominal expression.

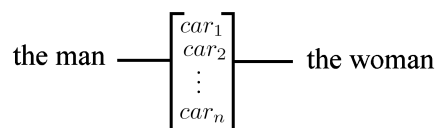**(5)** the man's and the woman's cars

As with (4), the NP analysis of (5) avoids the problems of the DP analysis by granting headship to nouns, instead of determiners. Thus, the noun *cars* heads the entire nominal expression NP, and *the man's* and *the woman's* are conjoined to instantiate a single DP specifier:

(5) the man's and the woman's cars

```
                                        NP
                               _____/  _____
                              /                    \
                            DP                       N′
                      _____/  \_____                 |
                     /      |       \                N⁰
                   DP     CONJ       DP             cars
                 __/\__    and     __/\__
                /      \          /      \
              NP        D′      NP        D′
            _/  \_      |      _/  \_      |
           DP    N′    D⁰     DP    N′    D⁰
           |     |     's     |     |     's
           D′    N⁰           D′    N⁰
           |    man           |    woman
           D⁰                 D⁰
          the                the
```
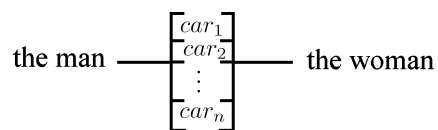
Notice that, unlike the DP structure of (5), no non-surface elements exist in the NP structure.

The NP analysis also yields both semantic interpretations of (5). Recognition of the first reading (joint possession of a set of two or more cars) is fairly straightforward: There exists a set of two or more cars, represented by the noun head *cars*. This noun has as its specifier the coordinated DPs *the man's* and *the woman's*. Semantically, therefore, the set of cars is specified as belonging to both the man and the woman:

$$\text{the man} \quad \rule[0.5ex]{2em}{0.4pt} \begin{bmatrix} car_1 \\ car_2 \\ \vdots \\ car_n \end{bmatrix} \rule[0.5ex]{2em}{0.4pt} \quad \text{the woman}$$

Derivation of the second reading (complementary possession) is less straightforward but still possible. Notice that the NP structure specifies the set of cars as belonging to both the man and the woman, but makes no claims regarding the distribution of that possession. This is in contrast to the DP analysis, whose duplication of the NP *cars* yields full possession of a set of cars by the man and full possession of a set of cars by the woman, where coindexing indicates that the sets are the same. In the NP structure, however, any distribution of possession is possible, because the only condition to be satisfied is that both the man and the woman can be said to have some share in ownership of the set:

$$\text{the man} \quad \rule[0.5ex]{2em}{0.4pt} \begin{bmatrix} car_1 \\ car_2 \\ \vdots \\ car_n \end{bmatrix} \rule[0.5ex]{2em}{0.4pt} \quad \text{the woman}$$

The NP Hypothesis, therefore, in contrast to the DP Hypothesis, avoids forcing a single semantic interpretation of (5).

3   Conclusion

Both the NP and DP Hypotheses exhibit specific weaknesses in their analyses of possessive nominal expressions. The NP Hypothesis, in granting headship and selectional power to nouns, necessarily overgenerates while conforming to the accepted GB selection principles, producing such ungrammatical nominals as *a women's rights*. The DP Hypothesis, by contrast, avoids such ungrammatical nominals by granting headship and selectional power to determiners, which select for appropriate properties on the heads of their NP complements. However, in doing so, the DP Hypothesis must insert a determiner where there is none in the surface form of a nominal, because nominal expression DPs must always be headed by determiners. The DP Hypothesis also fails to capture all possible semantic interpretations of certain coordinated possessive nominals because its commitment to determiner headship of a nominal forces the instantiation of two separate phrases where there are two *'s* determiners. Both problems of the DP Hypothesis are avoided in the NP Hypothesis. With regards to the first, the absence of a **determiner** in the surface form of a nominal does not jeopardize a structure whose form is based on the headship of the **noun**. As to the second problem, the headship of the possessed noun results in no specific relationship to any individual member of the coordinated possessor DP, preserving the ambiguity of the construction and allowing all possible semantic interpretations to be obtained from the tree structure.

It is not my intent to declare either hypothesis superior to the other, but merely to note the following: The complementary nature of the DP and NP Hypotheses observed here, that where one is strong the other is weak (and vice versa), should be enough to prevent any serious syntactician from rejecting either outright.