

# Restrictions on English Possessors: An Extension of Distributed Morphology\*

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## 1 Introduction

In English, there are restrictions on the possessive form of various pronominal elements. In particular, the demonstrative pronouns *this*, *that*, *these*, and *those* cannot be possessors in the 's construction (also known as the Saxon genitive), as in *\*that's cover*. A demonstrative with an overt noun is fine, however, as in *that book's cover*.

- (1) Grammatical and ungrammatical demonstrative possessors
- |                                    |                               |
|------------------------------------|-------------------------------|
| a. [That book]'s cover is worn.    | *[That]'s cover is worn.      |
| b. [This book]'s cover is worn.    | *[This]'(s) cover is worn.    |
| c. [Those books]' covers are worn. | *[Those]'(s) covers are worn. |
| d. [These books]' covers are worn. | *[These]'(s) covers are worn. |

The contrast in (1a) is not due to phonology. For example, the demonstrative *that* is happy with a left-leaning /-z/ morpheme in other circumstances, as in *That's my friend Bob*. In that example, the /-z/ is a reduced copula (from *is*), but the segments are the same as in our ungrammatical sentences in (1).

The contrast shown above is also not likely to be semantic in nature. *This* and *that* as demonstratives can be in the same relationship in different constructions.

- (2)
- |  |
|--|
| a. The cover of/on/for/around that book is worn. |
| b. The cover of/on/for/around that is worn.      |
| c. That book's cover is worn.                    |
| d. *That's cover is worn.                        |

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It is possible that there are semantic/processing differences between the Saxon genitive on the one hand, and the *of* construction and the various prepositional constructions (*on*, *for*, *around*) on the other hand. Even so, it is not clear exactly what those differences might be in this case, and if there were differences how they could account for the ungrammaticality of *\*that's*. Rosenbach 2005 describes a number of different factors that can influence the choice between the Saxon genitive and the *of* genitive. In English, there is a tendency for elements to occur first if they are discourse-given, short, or animate. Because the Saxon genitive has the possessor as the first element, this construction favors given, short, animate possessors. This effect is usually gradient, but the difference exemplified in (2) appears to be (nearly) categorical. Moreover, *that* is shorter than *that book*, leading us to believe that (2d) should be better than (2c), contrary to fact.<sup>1</sup> As there is no explanation readily available for the facts in (2) from the viewpoint of givenness, length, or animacy, we will pursue a primarily morpho-syntactic account of this phenomenon. The semantic motivation for our account will be limited to explaining why some forms have gaps and not others.

The proposal is as follows: The lack of possessive demonstrative pronouns is due to a morphological gap. This morphological gap is of a type that cannot be saved by using the general 's possessive. The only way to have a demonstrative in a possessive construction is to give the demonstrative an overt noun, bypassing the morphological gap.

In the following section, we will briefly consider an analysis using a Lexicalist approach. We will see that it captures some morphological gaps easily, but there are problems with the approach. I will then present two analyses based on Distributed Morphology, formalizing how these morphological gaps work. The first analysis (Section 3) is mostly a translation of the Lexicalist approach into DM terminology. The second analysis (Section 4) is more of a departure from the Lexicalist approach. Under this view, possessive pronouns and regular possessive nouns have similar Syntax, with the Morphology being the driving force of their differences. In order to follow this line of thought, the analysis makes crucial use of **flag-throwing Vocabulary Insertion rules**: rules that do not simply insert phonological forms, but rather mark the entire utterance as ungrammatical. Section 5 explores a possible re-working of this analysis. The paper then goes on to look at possible semantic motivations for why these pronouns are the targets of morphological gaps in English (Section 6). I explain a previous analysis connecting these gaps to NP Ellipsis in Section 7, and issues of learnability are discussed in Section 8. Section 9 concludes.

## 2 A Lexicalist Approach

One analysis of the gap in demonstrative possessives involves the lexicon as a collection of word entries. If the lexicon does not have an entry, then the syntax would not have access to it during lexical insertion. For instance, there is no entry corresponding to the

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<sup>1</sup>It is difficult to test for givenness, because demonstratives and determiners that are similar to them tend not to be given—more run-of-the-mill pronouns (*he*, *she*, *it*) take their place. Animacy is also hard to test for, but in the case of *which*, a possessive form is unavailable regardless of its animacy.

- (i) a. \*Of the Backstreet Boys, which's hair style do you like the most?
- b. \*Of the classes you're taking, which's teacher do you like the most?

features [demonstrative, distal, singular, POSS], so there is no *\*that's*. Likewise for the other demonstratives.

The table in (3) gives an overview of what the lexicon of English would look like concerning pronouns. The table provides the nominative, accusative, and possessive forms for various pronouns. The dependent form (Huddleston et al. 2002) is the form of the possessive before an overt noun, as in *my dog*. The independent form (also known as the possessive pronoun) is the form that occurs alone or when the noun complement is deleted. The table also shows that there are other gaps in the English possessive besides the demonstratives. The independent form of *its* is missing, and so are both possessive forms for the discourse-linked *which*.

features	nominative	accusative	dependent possessive form	independent possessive form
1sg	I	me	my	mine
1pl	we	us	our	ours
2sg	you	you	your	yours
3sg.masc	he	him	his	his
3sg.fem	she	her	her	hers
3sg.-human	it	it	its	*
3pl.	they	them	their	theirs
wh.+human	who	who(m)	whose	whose
wh.d-linked	which	which	*	*
proximal.sg	this	this	*	*
proximal.pl	these	these	*	*
distal.sg	that	that	*	*
distal.pl	those	those	*	*

This table is not the end of the story, however. While pronouns may have special possessive forms, in both independent and dependent flavors, there is also a general possessive clitic *'s*. This clitic attaches to the right edge of the noun phrase, and it is the same form in independent and dependent environments.

- (4) a. [The guy next door]'s book.  
 b. This book is [the guy next door]'s.

The absence of a possessive form for *that* is particularly interesting in light of the fact that there is a general rule for deriving possessive forms: add *'s* to the right edge. To account for the facts, we need to stipulate that *'s* does not co-occur with pronouns. This way all pronouns are forced to go to the lexicon to receive a possessive form, and if there is no possessive form there, lexical insertion fails. *That book*, as a non-pronominal DP, is allowed to combine with *'s*, while *that* as a pronoun is not. This gives us the difference in grammaticality in (1).

What exactly is the nature of this restriction on pronouns and *'s*? Is this analysis dependent on the strict Lexicalist Hypothesis (as argued against in Marantz 1997)? To answer these questions, it will be useful to provide an explicit analysis in a framework that is not dependent on the strict Lexicalist Hypothesis. We will pursue how this mechanism

can be formalized in Distributed Morphology in the next section.

### 3 A Translation Into Distributed Morphology

#### 3.1 Three Lists

This approach is based on Distributed Morphology (Halle & Marantz 1993, Embick & Noyer 2001). DM, in terms of architecture of the grammar, proposes that the Syntax is the primary generative engine of the grammar. The output of the Syntax then serves as the input to the Morphology proper.

Distributed Morphology is **distributed**, in part, because the work that was done by the Lexicalist lexicon is distributed among multiple mechanisms in the grammar. Lexical rules have been reinterpreted and rearticulated as either Syntactic rules, or rules on the way to PF. Most importantly for our purposes, one of the jobs of the Lexicalist lexicon is to store idiosyncratic information. In DM, this work is distributed between three lists. Following Marantz 1997, these lists are numbered 1 – 3. List 1 is the **narrow lexicon**, a collection of morphemes (bundles of features) that the narrow Syntax takes and manipulates (under Minimalism, this would entail the familiar operations Select, Merge, Move, and Agree). List 2 is the **Vocabulary**, a collection of insertion rules that give phonological form to abstract grammatical features. List 3, the **Encyclopedia**, is responsible for storing idiosyncratic information related to meaning. All three lists are necessary for the functioning of the grammar, but they make their contribution at different points of the derivation and work in different ways.

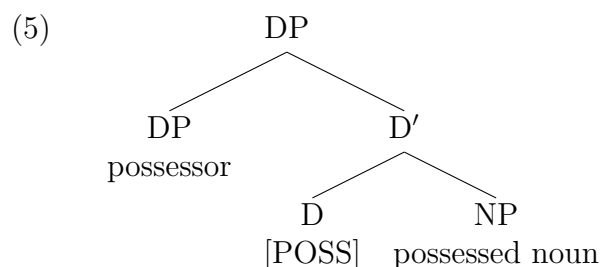
The Lexicalist approach in Section 2 had the morphological gap responsible for *\*that's* in the general Lexicon, but in a move to DM, it is an open question as to which list the gap should be localized in. The analysis below puts the gap in List 1. By doing this, we are forced to give different Syntactic accounts for possessive pronouns and possessive nouns. The analysis in Section 4 localizes the morphological gap in List 2. While this simplifies the Syntax, providing the same Syntactic configuration for possessive pronouns and nouns, it greatly complicates the Morphology. We will not investigate the implications of putting this gap in List 3, especially because it appears that meaning is not really involved, but it is theoretically possible.

#### 3.2 A Gap in the Narrow Lexicon

Localizing the morphological gap in the narrow lexicon (List 1) appears to be the most direct translation of the Lexicalist approach from Section 2. In this view, the narrow lexicon contains those possessive pronouns that are allowed but not the ones with gaps. For example, the first person singular pronoun has a possessive form, therefore it has a composite possessive morpheme in the lexicon [1, sg, POSS]. Likewise, there is no possessive form of *that*, so there is no [demonstrative, distal, sg, POSS] in the lexicon. So far, this looks nearly exactly like the Lexicalist approach.

The second necessary ingredient, also from Section 2, is the restriction of pronouns combining with the 's construction. Taking 's to be a morpheme composed of the feature [POSS],

the narrow Syntax needs a restriction on pronouns alone combining with [POSS]. I am assuming the structure in (5), which is based on Abney 1987. The head of the larger DP is [POSS]. [POSS] takes an NP complement, which is the possessed noun together with any complements or modifiers. In the specifier of [POSS] sits the possessor DP. At the moment, this is only the structure for possessive nouns, not possessive pronouns. Pronouns must come from the narrow lexicon fully formed for the possessive, and they cannot combine with the [POSS] morpheme in the Syntax or at any point later in the derivation.



One way to formalize the co-occurrence restriction is to make it part of the selectional properties of the [POSS] morpheme. The [POSS] morpheme has very exacting requirements on what kinds of morphemes can appear in its specifier position—namely, no pronouns allowed. If the possessor DP is a single morpheme, then it must be  $[-pn]$ , with  $[pn]$  being a cover feature for whatever features distinguish pronouns from regular DPs.

- (6) Possessive morpheme ('s): [POSS]  
 Selectional requirements: [ DP $_{[-pn]}$  \_\_\_ NP $_{optional}$  ]<sup>2</sup>

One important thing to note is that when pronouns occur with other material, then they are possible possessors to the general [POSS] morpheme. For instance, in (7) the pronoun *who* has extra material (*the hell*), yet is still combines with [POSS].

- (7) [DP Who the hell ] 's car is that?

The extra material does not necessarily need to be to the right of the pronoun. The pronoun could very well be the last element of the DP, but it can combine with [POSS] as long as it is not the only element. This is true for both personal pronouns, as in (8), and demonstrative pronouns, as in (9).

- (8) [DP The girl who talked to me ] 's friends all made fun of my shirt.  
 (9) (Pointing to a gadget) I'd like [DP the owner of *that* ] 's salary!

Whatever technique we use to distinguish pronouns from regular DPs must assign *who the hell* and *the girl who talked to me* to the latter category. This also means that the restriction cannot simply say that the sequence of a pronoun followed by [POSS] is ungrammatical.

<sup>2</sup>In terms of Bare Phrase Structure, this requirement can be restated as allowing [POSS] (with its optional complement) to combine with any syntactic object of label D, with the requirement that the syntactic object not be minimal. As long as pronouns are the only objects of label D that are simultaneously minimal and maximal, then this restatement is successful. This means that we cannot treat proper names as simple Ds. It also means that any added material can save the possessive form, which appears to be the right generalization.

Rather, the restriction is structural.

Given the assumptions outlined above, the grammar can rule out forms like *\*that's cover* while still allowing *that book's cover*. To that extent, the translation of the Lexicalist approach is a success. But what about the possessive *its*? Recall that there is a dependent form (*its ideas*) but no independent form (*\*These ideas are its*). To include this, the selectional requirements for *its* must make the complement NP mandatory.

- (10) Third person non-human possessive morpheme (*its*): [3, sg, -human, POSS]  
 Selectional requirements: [ \_\_\_ NP<sub>mandatory</sub> ]

Even this is insufficient, though, because there is the possibility that the possessed NP will be deleted by some post-Syntactic ellipsis process (and the result of that would still be ungrammatical). For example, the Syntax might output the structure corresponding to *its ideas*, and the Morphology or the Phonology might delete *ideas*. Some further filter on ellipsis is necessary to ensure descriptive adequacy (and therefore to prevent *ideas* from deleting in our example). The reason for this is the assumption that the restriction on *\*that's* and *its* only comes from the narrow lexicon, which is the set of building blocks that the Syntax proper manipulates. Therefore, it is necessary for the generalizations of the narrow lexicon to continue transparently throughout the derivation. It must not be the case that a later process re-creates the same environment that the narrow lexicon forbids in the first place, in this particular approach to morphological gaps. There does not appear to be a straightforward and principled way to ensure this.

This approach is partially successful, but there are some costs involved. The present analysis depends on developing a system for distinguishing pronouns from non-pronouns, controlling for post-Syntactic ellipsis, and it uses a very powerful system of selectional requirements, where the [POSS] head morpheme is quite picky about what appears in its specifier position. The analysis also provides for a different Syntax for possessive pronouns and regular possessive DPs. We already know that the form of pronouns changes with respect to case and independent/dependent possession, so we need a mechanism for dealing with pronouns post-Syntactically anyway. So if possible, I would like to have a single unified Syntax for possessives in English, with special rules for pronouns post-Syntactically. The next section approaches the problem of accounting for the morphological gaps in this manner, extending the Morphological system for pronouns to account for the gaps.

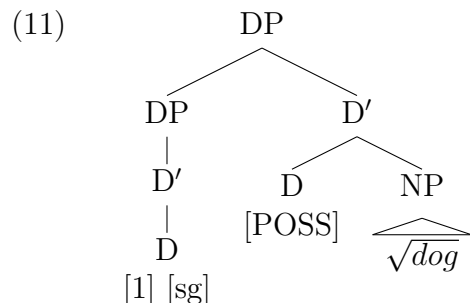
## 4 A Gap in the Vocabulary

In this section, an approach is outlined that explains the morphological gap of *\*that's* and others like it by appealing to the Vocabulary (List 2).

### 4.1 Vocabulary Insertion and the Extended Subset Principle

As we did previously, we will assume the internal Syntax of possessive DPs is something like (5). However, this will be the structure for both possessive pronouns and regular possessive DPs. For example, the DP *my dog* will actually consist of three primary morphemes: the first person singular pronoun, [POSS], and the possessed noun *dog*. The Syntax combines

and manipulates these morphemes, outputting a tree like (11). The possessor is the first person singular D, and the possessed noun is the root *dog* along with some nominalizing element (not shown here for simplicity).



The Morphology, in the form of Vocabulary Insertion rules, is responsible for providing the correct form. When there is an overt noun complement to [POSS], the dependent form is inserted; when there is no overt noun complement, the independent form is inserted. The following Vocabulary Insertion rules govern the first-person singular forms.

(12) *my* ↔ [D, 1, sg] if it is the only element in the specifier of [POSS]

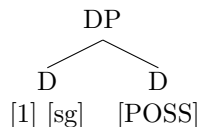
(13) *mine* ↔ [D, 1, sg] if it is the only element in the specifier of [POSS] **and** [POSS] has no overt complement<sup>3 4</sup>

The two Vocabulary Items compete for realization of the same features: [D, 1, sg]. The choice is determined by Hankamer & Mikkelsen 2005's **Extended Subset Principle**:

“...If two or more Vocabulary items contain the same features but differ in contextual specification so that the contextual specification of one item is a subset of the contextual specification of another, the item with the more restricted contextual specification must be chosen.” (p. 105)

This is an instantiation of what is known as Panini's Principle, where a more specific rule blocks the application of a more general one. In the standard DM Subset Principle, the specificity is in terms of the features: the Vocabulary item with the most features will be inserted, blocking other Vocabulary items that only have a subset of the features of the winning Vocabulary item. The Extended Subset Principle extends this idea to the contextual specification.

<sup>3</sup>In terms of Bare Phrase Structure, this situation can also be described by requiring that [POSS] and the [1, sg] pronoun be in direct construction.



<sup>4</sup>Some of the same problems about the order of derivation (with respect to deletion) mentioned above may also apply in this proposal. One major advantage to having the generalizations stored in the Vocabulary (List 2) is that it can be sensitive to post-Syntactic ellipsis. So, when the rule states ‘no overt complement’, this means it is compatible with a situation where no complement originates in the Syntax, and also where there is a Syntactic complement that undergoes deletion in the Morphology. As long as the deletion takes place at or before the point of Vocabulary Insertion, then this proposal has no problem.

The rule for *mine*, (13), is the more specific one, so it must be chosen when its contextual specifications are met (i.e. [POSS] has no nominal complement). Otherwise, we use the dependent form *my*, as given by the rule in (12).

For the example of *my dog*, the features [D, 1, sg] in the tree in (11) correspond to the Vocabulary Insertion rules given above. Because the more specific rule (13) does not describe the appropriate environment, we must use the less specific rule (12). The phonological form *my* is inserted, and we eventually arrive at *my dog* instead of *\*mine dog*.

## 4.2 Default Possessives

The analysis so far consists of Vocabulary Insertion rules that provide the correct possessive form for the pronouns (independent and dependent). It isn't the case, however, that every possible DP has a corresponding Vocabulary Insertion rule for the possessive form. The only feature-bundles that have these specific rules for possessive forms in English are the pronouns. In all other situations, the general rule that we previously mentioned (add 's to the right edge) comes into effect. To formalize it in terms of Vocabulary Insertion rules, the possessive DP is realized in the same way as it is in subject or object position (some type of default case). The possessive morpheme (POSS) is realized as 's, which is expressed by the Insertion rule (14).

$$(14) \quad 's \leftrightarrow [\text{POSS}]$$

In order to get the possessive form of *[the guy next door]'s dog*, the possessor DP *the guy next door* is in the default case. Then the default form of [POSS] is inserted.

Assuming that the accusative is the default in English, this means that competing with *my* is also the default *\*me's*. In such a situation, the possessor is inserted as the default *me*, and [POSS] is inserted as the default 's.

$$(15) \quad me \leftrightarrow [\text{D}, 1, \text{sg}]$$

The Extended Subset Principle will ensure that *my* is inserted instead of *me*, because (12) is more specific in its contextual specification than (15) is. In fact, all three of the rules for [D, 1, sg] can be ordered in terms of contextual specificity. *Me* is the least specific, *my* is more specific, and *mine* provides the most contextual specification of all the rules.

$$(16) \quad \begin{array}{l} \text{a. } me \leftrightarrow [\text{D}, 1, \text{sg}] \\ \text{b. } my \leftrightarrow [\text{D}, 1, \text{sg}] \text{ if it is the only element in the specifier of } [\text{POSS}] \\ \text{c. } mine \leftrightarrow [\text{D}, 1, \text{sg}] \text{ if it is the only element in the specifier of } [\text{POSS}] \text{ and } [\text{POSS}] \\ \quad \text{has no overt complement}^5 \end{array}$$

There is one more complication left to reconcile the general possessive rule with the more specific forms. The Vocabulary Insertion rules must not realize [POSS] as 's when it appears after a pronoun, or the result would be *\*my's* and *\*mine's*, which are just as bad as *\*me's*.

<sup>5</sup>The choice of making *my* the more general form and *mine* the more specific is arbitrary—the analysis works the same if *mine* is general and *my* is only inserted when the requirements for *mine* are met and there is an overt complement to [POSS]. The choice of making *me* the most general form for [D, 1, sg] is not arbitrary, however.



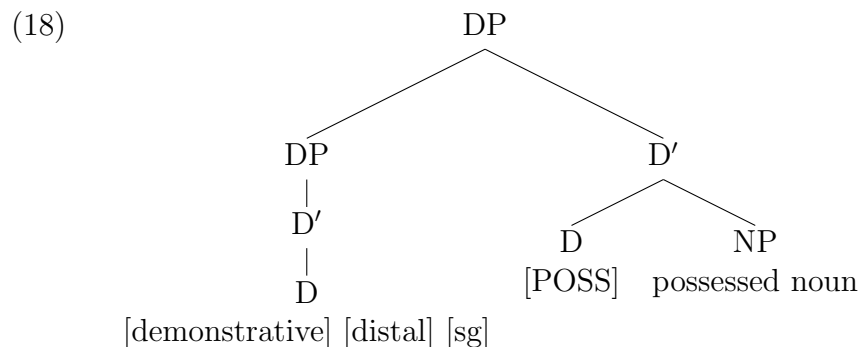
The rule in (17) inserts silence when the possessor is a personal pronoun, preventing the ungrammatical forms.

(17)  $\emptyset \leftrightarrow [\text{POSS}]$  when the specifier of  $[\text{POSS}]$  is only a D with [1], [2], or [3].

### 4.3 Accounting for Gaps

Throughout this section we have used rules to give phonological forms to morpho-syntactic features—this is standard for Distributed Morphology. This analysis must also account for the morphological gaps mentioned earlier. I propose that the Vocabulary Insertion rules should also be used to formalize these gaps. This is an extension of the use of Vocabulary Insertion rules in Distributed Morphology. With this extension to DM, the mechanism for preventing *\*that's* is a Vocabulary Insertion rule, an active rule that crashes the derivation when it comes across a particular environment.

Under this view, the Syntax overgenerates, giving us forms like (18). The Vocabulary Insertion rule in (19) filters out structures of this sort.



(19)  $* \leftrightarrow [\text{D, demonstrative}]$  if it is the only element in the specifier of  $[\text{POSS}]$

The rule in (19) calls for a demonstrative that is alone as a possessor. If the featural and contextual specifications of rule (19) are met, then the Morphology throws a flag, causing the derivation to crash. This is a **flag-throwing Vocabulary Insertion rule**. It does not insert phonological content, but rather it crashes the derivation.<sup>6</sup> The term is an analogy for when sports referees throw flags to indicate an infraction of the game rules.

The rule in (19) only prevents bare possessive demonstratives. When *that* occurs with a noun, then the structural description of (19) fails to match, because it isn't the only element as a possessor. In this way, the Morphology can allow examples like *[that book]'s cover*. The possessor *that book* is realized in default case, and  $[\text{POSS}]$  is realized as 's, both very general rules.

<sup>6</sup>The exact method of how the rule forces the derivation to crash is up for debate. Two things are certain: It is not simply that the rule inserts silence, because Vocabulary Insertion rules can insert null morphemes. Also, the features don't simply remain for another rule to work on. In such a case, we might expect the default rule for demonstratives to come into effect.

Under a Minimalist viewpoint, the rule in (19) could insert an uninterpretable feature,  $[*]$  or  $[\text{morph-gap}]$  or the like. This feature would never be checked, because it is inserted after the narrow Syntax, and therefore the derivation would crash. Empirically, there doesn't appear to be any evidence for one method of crashing over another, as long as default forms are not allowed to save the derivation.

We can also use this formalism to account for the distribution of *its*. There is a dependent form available (*its cover*), but no independent one (*\*this cover is its*). The rule for the dependent form of *its* looks nearly identical to the rule for *my*. All that is different from *my* are the features and the phonological form.

(20)  $its \leftrightarrow [D, 3, sg, -hum]$  if it is the only element in the specifier of [POSS]

The rule in (21) is responsible for marking the independent form of *its* as ungrammatical.

(21)  $* \leftrightarrow [D, 3, sg, -hum]$  if it is the only element in the specifier of [POSS] and [POSS] has no overt complement

This machinery might seem overly complicated. One traditional way to account for morphological gaps is to say that the form simply doesn't exist in the lexicon. Why can't we just say that there is no rule for possessive demonstratives in the lexicon? Remember that in Section 2 the simple analysis of not being in the lexicon was untenable: not only is there no possessive form of *that*, but the grammar cannot even make a possessive form through general rules.

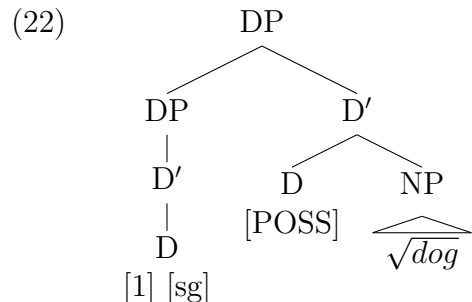
Therefore, it's not enough to say that there is no Vocabulary Insertion rule for the independent form of *its*, or for any possessive form of *that*. If there simply were no such rule, then the default rules would have to come into effect. The flag-throwing Vocabulary Insertion rules actively prevent the default rules from applying, and they do so through the mechanism of the Subset Principle and the Extended Subset Principle.

The Morphology was able to rule out *\*me's* with more specific Insertion rules. This was a type of blocking: the general, more complex *\*me's* is blocked by the specific, mono-morphemic *my*. This blocking is exactly what the flag-throwing Vocabulary Insertion rules in (19) and (21) are doing. The only difference is, there is no realized specific, mono-morphemic possessive to block the default form—not even a phonologically null version. Rather, with flag-throwing rules the more specific element, the element that blocks the default form, is the very thing that makes the derivation crash.

We are not in a position to abandon the general rule for possessives, or any general rule for that matter. General rules are extremely useful, especially when dealing with open-class items and the combination of those items with functional elements. Having lots of general rules captures the intuition that the Morphology will almost always figure out some way to realize the features and structure that Syntax hands it. In some situations though, like those explored so far with the flag-throwing Vocabulary Insertion rules, the Morphology cannot deal with what the Syntax gives it, and ineffability results.

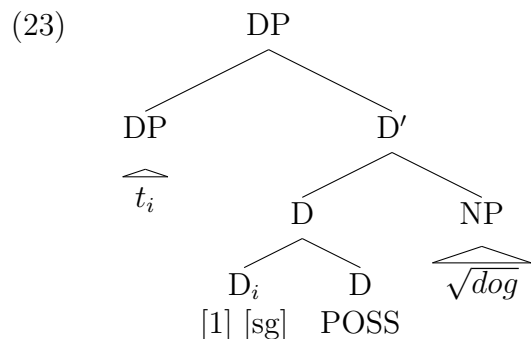
## 5 Lowering and Fusion

Consider the following tree, repeated from (11).

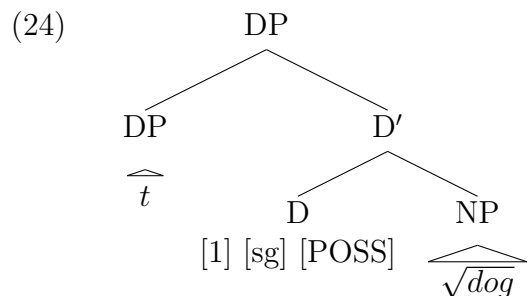


In Section 4, the Vocabulary Insertion rules inserted the possessive form *my* for [D, 1, sg], because it is the only element in the specifier of [POSS]. The rules also inserted silence for [POSS], because its specifier consisted of only a personal pronoun.

There is another way of looking at this problem in Distributed Morphology, given the same syntactic tree as input to the Morphology. The pronoun could lower, or [POSS] could raise, giving us a complex head structure. The tree in (23) demonstrates a lowering analysis.



The two Ds could then combine by fusion, resulting in a large element with the features [D, 1, sg, POSS].

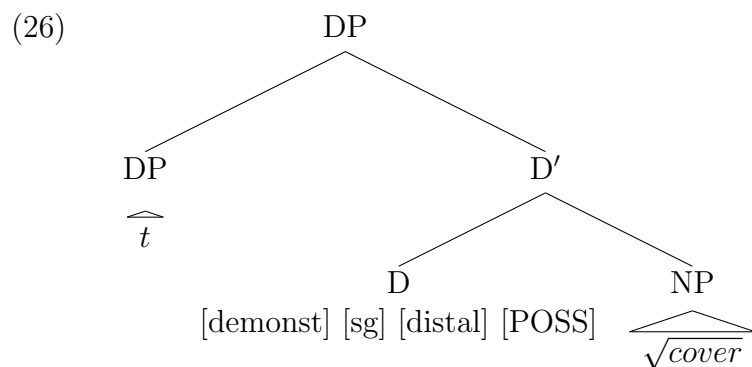


With the proper Vocabulary Insertion rules, given in (25), the correct form *my* would be inserted. Note that these rules are different than the ones proposed in Section 4. Under that analysis, [POSS] is a contextual environment. In the rules in (25), on the other hand, lowering and fusion have turned the contextual environment into the featural specification of a single head. In other words, now [POSS] contributes to the features of the whole pronominal D.

- (25)
- a. *my* ↔ [D, 1, sg, POSS]
  - b. *mine* ↔ [D, 1, sg, POSS] if it has no overt complement.

An analysis along these lines might be equivalent or superior to the one proposed in Section 4. In particular, a fusion analysis helps explain why we only get one phonological realization of the [POSS] morpheme. This is because the morpheme itself moves to be expressed on the pronoun, while in the proposal in Section 4, [POSS] could both affect the phonological form of the pronoun **and** be realized independently. For a form like *my*, we had to say that [POSS] is only seen in the phonology as the contextual specification for the form *my*, the possessive morpheme being realized as silence. On the other hand, for regular possessives like *Bob's*, the contextual specification is unimportant, and the possessive morpheme is realized as an actual phonological form 's. It appears that there is a conspiracy at hand: the possessive morpheme only affects the phonological output in either the contextual specification of the pronoun, or as an independent form 's, but not both. Such double-marking does not appear in formal English, but there is evidence for it in some informal varieties of English. For some varieties that have *you guys* or *you all* as a type of plural second-person pronoun, available possessive forms include *your guys'* /jər gaɪzəz/ or *your all's*. In forms like these the possessive morpheme has an effect on the phonological form of *you* and it gets realized as the clitic 's. If we wish to account for these forms, the conspiracy of [POSS] realization is not as strong of a motivating factor in the design of our approach, and the fusion analysis is not superior. If we have to take into account double-marking of possessives, then we might as well incorporate it into our entire system. For formal English, however, the fusion analysis might be a little cleaner with respect to the phonological exponent of [POSS]—some of the Vocabulary Insertion rules are simplified, and the lack of double-marking is incorporated completely into the analysis.

A complication becomes apparent when tackling the morphological gap problem. Suppose that the Syntax produces a tree corresponding to *\*that's cover*. The demonstrative pronoun *that*, with the features [D, demonstrative, sg, distal], would lower to [POSS] and fuse with it. This would result in a tree like (26). We would then want a flag-throwing Vocabulary Insertion rule like (27) to apply, crashing the derivation.



(27) \* ↔ [D, demonstrative, POSS]

One possible problem comes about because there is another rule for the singular distal demonstrative. In fact, there are four rules, each corresponding to a different combination of distal/proximal and number.

- (28)
- a. that ↔ [D, demonstrative, sg, distal]
  - b. those ↔ [D, demonstrative, pl, distal]

- c. this  $\leftrightarrow$  [D, demonstrative, sg, proximal]
- d. these  $\leftrightarrow$  [D, demonstrative, pl, proximal]

The rules cannot be related to each other by the Subset Principle or the Extended Subset Principle, because one rule's features are not a subset of another rule's features. If we use a form of (admittedly naïve) feature counting, the rule in (28a) matches four of the features found in the tree in (26), while our flag-throwing Vocabulary Insertion rule (27) only matches three of the features. Rule (28a) is a better match, so if only one Vocabulary Item is to be inserted, it should be *that*. The result would be *that cover*, but with the meaning of *that one's cover* or what we might think *\*that's cover* would mean. This is not the desired result. The flag-throwing Vocabulary Insertion rule must apply, even though rule (28a) is a better fit for the features involved.

One way around this is to use a more sophisticated algorithm for determining who wins in these types of feature disagreements. Adopting the view proposed by Noyer 1992 and Harley 1994, a universal feature hierarchy (or geometry) is responsible for deciding which Vocabulary Insertion rule should take effect. If we propose that [POSS], as a feature, is higher up in the feature hierarchy than [sg] and [distal], then that would guarantee that (27) would be used as opposed to (28a). I have no way of knowing if it is possible or useful to have a feature hierarchy or feature geometry consistent with this stipulation, so I will leave the lowering and fusion analysis as an open possibility.<sup>7</sup>

## 6 Semantic Motivation

### 6.1 Possessives and the [−human] feature

The gaps that we have been investigating all involve the genitive (possessive) case—every pronoun in the table in (29) has a nominative and an accusative form, but not every pronoun has a genitive form. Furthermore, those pronouns with morphological gaps are [−human], while all the pronouns that are actively [+human] have a genitive form.<sup>8</sup> The table below is an elaboration of (3).

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<sup>7</sup>This problem also appears in the analysis in Section 4, but it is easier to spot in the Lowering and Fusion analysis. Following the tree in (18), it also appears that the Vocabulary Insertion rule for *that* has a superset of the features compared to the flag-throwing rule in (19). To avoid this, we would have to give an ordering to the rules, or give some type of precedence to rules with contextual specification.

<sup>8</sup>I am not particularly interested in the exact nature of the [human] feature. Specifically, I am not sure if it is more accurate to call the relevant feature [animate] or [human]. The appropriate analysis would depend on judgments of sentences like the following: *These bones aren't mine, they are actually theirs*, where the referent of *theirs* is a group of dogs. Because sentences like these do not seem perfect to me, I will call the relevant feature [human], but this is not a crucial aspect of the investigation.

features	nominative	accusative	dependent possessive form	independent possessive form
1pl	we	us	our	ours
2sg	you	you	your	yours
3sg.masc	he	him	his	his
3sg.fem	she	her	her	hers
3sg.–human	it	it	its	*
3pl.+human	they	them	their	theirs
3pl.–human	they	them	their	*
wh.+human	who	who(m)	whose	whose
wh.d-linked	which	which	*	*
proximal.sg	this	this	*	*
proximal.pl	these	these	*	*
distal.sg	that	that	*	*
distal.pl	those	those	*	*

The goal of this section is to explore these gaps in terms of the [human] feature. In particular, why is this feature the locus of the gaps? Why do [–human] pronouns have gaps, but [+human] pronouns don't? Why not the other way around?

We will look at two different but related morphological gaps. In subsection 6.2, we will investigate the lack of an independent genitive for *its* and *theirs* for [–human] referents. Subsection 6.3 looks at a related gap: the lack of *\*which's* and the use of *whose* as a relative pronoun compatible with [–human] objects. This part of the investigation is mostly agnostic as to which analysis of the gaps is best: this section provides semantic motivation for why these are the targets of gaps, but it could work with either gaps in the narrow lexicon or flag-throwing Vocabulary Insertion rules.

## 6.2 Its and Theirs

If we ignored the forms *its* and *theirs*, then the generalization behind the morphological gaps would be extremely simple: only [+human] pronouns are allowed in the genitive form. This would allow the first and second person genitive pronouns (which we can assume to be automatically [+human]), the third person *his* and *her(s)*, as well as the [+human] wh-pronoun *whose*. All other genitive forms would be disallowed, accounting for most of the data in (3).

This generalization, of course, is overly simplistic. The third person [–human] pronouns do indeed have genitive forms, but only in certain environments. The genitive form of *its* and *their* ([–human]) are disallowed when they occur without an overt complement—in other words, there is a morphological gap for the independent form of these two pronouns. The [human] feature appears to be the main culprit, as *theirs* as an independent genitive is perfectly fine when the referent is [+human].

- (30) a. (Pointing to some children:) These toys are theirs.  
 b. (Pointing to some chairs:) \*These cushions are theirs.

One possible analysis might propose that the availability of these forms is due to con-

trastive focus. Under this analysis, [−human] pronouns are allergic to contrastive focus. Situations where the pronoun must be in the independent genitive form are the very same situations where this form would get contrastive focus. However, if we compare the sentences in (31), we see that the sentence with strong contrastive focus (31a) is **better** than the sentence without strong contrastive focus but with the independent form of *its* (31b).

- (31) a. This computer is smart, but **YOUR** ideas are much better than **ITS** ideas.  
 b. \*This computer is smart, but your ideas are much better than its ideas.

Our formal morpho-syntactic analysis is relatively straightforward. We have already developed a flag-throwing Vocabulary Insertion rule for the independent form of *its*, and the same can be done for the [−human] version of *theirs*. Still, there appears to be a semantic basis for why this gap centers around the [human] feature, and why the gap is of the [−human] pronouns and not the [+human] ones.

The reason involves how the genitive noun and the head (possessed) noun interact within the larger noun phrase. Genitive case can serve as a way to mark one of the thematic roles given by the head noun, or it can serve to mark that the genitive noun is in some relation to the head noun. (See Partee & Borschev 2003 and some of their earlier work referenced within for arguments on this dichotomy.) The first situation is what happens with relational nouns (like *father* or *favorite NP*) and deverbal nouns (like *destruction*). The second situation, where the noun is not necessarily relational, involves some type of contextually given relationship between the genitive noun and the head noun.

We won't have much to say about the relational and deverbal nouns, but the genitive form expressing contextual relationships appears to have some connection to the [human] feature.<sup>9</sup> In this situation there is an asymmetry regarding whether the genitive noun is [+human] or not. The relationships between the genitive noun and the head noun are varied: they include ownership (*Bill's car*), creation (*Bill's term paper*), inalienable possession or part/whole (*Bill's arm* or *the table's leg*), source (*Bill's ideas*), location (*this room's Persian carpet*, Huddleston et al. 2002), and other types of association. Certain contexts will of course favor some relationships over others. The list given is not meant to be exhaustive, but it is meant to be somewhat representative. While I have not conducted a corpus analysis, my intuition is that the notion of ownership is the most frequently used relationship for non-relational nouns. And this notion is mostly limited to [+human] entities—only humans and human-like beings can own property. If ownership is in fact a basic or dominant relation for non-relational genitives, then this would also explain why the morphological gaps are only found in [−human] pronouns. To have the gap extend to [+human] pronouns would be too costly. The strong functional need for [+human] pronouns referring to ownership is one possible explanation for why [+human] pronouns are spared from the morphological gap phenomenon. The [−human] pronouns, on the other hand, have less use for being owners in an owner-property relationship, and so they do have a gap in the morphological domain corresponding to this relationship, the genitive case.

<sup>9</sup>Barker & Dowty 1993 calls these uses extrinsic possessives. These can be distinguished from the relational nouns by the ungrammaticality of their equivalent paraphrase as a post-nominal of-phrase. So, for instance, *\*the car of Bill* is not nearly as good as *Bill's car*, but *the top of the table* and *the table's top* are both largely acceptable, because *top* is a relational noun.

This provides a partial semantic explanation for why the gaps in the genitive are only found in [−human] pronouns. We still don't know why the gaps exist at all, or why they are in the genitive case, as opposed to nominative or accusative. One possibility is that the nominative and accusative cases are much more frequently used than the genitive case. As such, there is less of a functional need to have morphological forms in the genitive case. Also, genitive case in non-relational nouns brings with it additional relationships (ownership and the like) that aren't brought into the meaning of the sentence by other cases. This, perhaps, makes them more marked in some way. So, while we don't have a semantic explanation for why these forms **cannot** exist, we do have an explanation for why, if some forms have to be missing, these forms are good candidates. The actual morphological gap will have to be encoded in the grammar in the form of flag-throwing Vocabulary Insertion rules or morphemes in the narrow lexicon.

### 6.3 Whose and Which's

*Whose* has an interesting distribution with respect to the [human] feature. In wh-questions, both matrix and embedded, *whose* is obligatorily [+human]. In relative clauses, however, it is compatible with both [+human] and [−human] nouns in many varieties of English.

- (32) a. Whose<sub>[+hum]</sub> grade is the highest?  
 b. \*Whose<sub>[−hum]</sub> (book) cover is torn?
- (33) a. I wonder whose<sub>[+hum]</sub> grade is the highest?  
 b. \*I wonder whose<sub>[−hum]</sub> (book) cover is torn?
- (34) a. The man<sub>[+hum]</sub> whose<sub>[+hum]</sub> drawings brought Winnie the Pooh to life spent the last years of his life hating the bear with very little brain. (BBC News)  
 b. The book<sub>[−hum]</sub> whose<sub>[−hum]</sub> cover is torn is actually worth the most.

Note that this is specific to the genitive *whose*. The non-genitive version *who(m)* does not share in this distribution.

- (35) a. (I wonder) who<sub>[+hum]</sub> has the highest grade?  
 b. \*(I wonder) who<sub>[−hum]</sub> is enclosed in a torn book cover?
- (36) a. The man<sub>[+hum]</sub> who<sub>[+hum]</sub> knew too much.  
 b. \*The book<sub>[−hum]</sub> who<sub>[−hum]</sub> has a torn cover.

One possible explanation for the distribution in (32) – (34) is that there are two homophonous pronouns of the form *whose*: the wh-question *whose* is specified as [+human], but the relative pronoun is underspecified for [human]. This might be a good answer, but like the situation with *its* and *theirs*, we can provide motivation for the morpho-syntactic restrictions.

In relative clauses with non-genitives, like (36), English can introduce the relative clause with different words. For both [+human] and [−human] contexts, the complementizer *that* can introduce the clause. If (and only if) the complementizer is absent, then a relative pronoun is used. *Who* is used for [+human] contexts, *which* for [−human] ones.



This distribution works well for non-genitive situations, but it runs into problems when we try to make a genitive form to correspond to a [−human] noun. For the most part, *that* as a C cannot create a genitive form<sup>10</sup>. There is also a gap where *\*which's* would be. The genitive of *which* is not found in wh-questions or in relative clauses, not even for [+human] nouns, as in *\*which student's grade*. For genitive relative clauses, the possibilities are limited. There is no *\*that's* nor is there *\*which's*, so a third option is used: the normally [+human] *whose* is used in the environment of a [−human] relative clause, even though there appears to be a [human] feature mismatch.

In wh-questions, the repair strategy for *\*which's* appears to be different. When a speaker would want to use *which* in the genitive, one way to get around it is to include the noun complement, as in *which NP's* or *Which book's cover is torn?* This repair strategy is not available for relative clauses, as shown in (37).

- (37) a. *\*The book which book's cover is torn is actually worth the most.*  
 b. *\*The man which man's drawings brought Winnie the Pooh to life...*

We already know that *\*that's*, *\*which's*, and *which NP's* are unavailable, so it appears that the only strategy left to save this construction is to bleach the relative pronoun *whose* of its [+human] feature. This is not so problematic, because there are strong contextual cues that the noun is not actually [+human] despite the use of *whose*. The head noun of the relative clause has to be overt, and this overt noun will show [human] features due to its lexical specification. The [−human] feature is therefore still visible in the output. Under this view, *whose* is [+human] in both wh-questions and relative pronouns. The mismatch in [human] specification is resolved by deferring to the specification associated with the head noun. In the example in (38), *whose* is [+human] and *book* is [−human] (because of what it means to be a book), and so the entire noun phrase *the book whose cover is torn* is resolved as [−human].

- (38) [The book<sub>[−hum]</sub> whose<sub>[+hum]</sub> cover is torn]<sub>[−hum]</sub> is actually worth the most

While there doesn't appear to be a strong motivation for the morphological gap of *\*which's*, if we take this gap to be stipulated, then we have a principled reason for why *whose* is used for [−human] nouns in relative clauses. With the unavailability of *\*that's*, *\*which's*, and *which NP's* as relative pronouns, the only option left is *whose*. Additionally, because the feature [−human] is still recoverable from the head noun, the mismatch can be resolved.

The morphological gaps cannot be reduced to semantic constraints, but the gaps appear to be motivated by the semantics. The way genitive case is used in English provides a reason why the gaps would be for [−human] genitive pronouns.

<sup>10</sup>Many people have mentioned Allison Day's work, where *that's* as a genitive relative pronoun is found to be uttered by English speakers. The example of *the book whose/that's cover* also has a discussion on Linguist List, reflecting the possibility of *that's*. Its use appears to be marginal, so I will view it as a (type of) morphological gap.

## 7 NP Ellipsis and Possessors

Our proposal is that the restriction on possessive demonstrative pronouns, independent *its*, and *\*which's* is due to a gap. It is an idiosyncrasy that must be observed, but not an overarching principle. The distribution of *its* gives support to this claim. *Its* only has a dependent possessive form, which already looks stipulative.

In earlier work, I tried to assimilate these facts to another generalization: DPs that have undergone NP Ellipsis cannot be possessors.

- (39) Bill and Joe each have a dog.
- a. Let's hide [Bill's dog]'s bone.
  - b. \*Let's hide [Bill's ~~dog~~]'s bone.

The example in (39) is similar to the morphological gap of *\*that's* and *\*which's*. Both involve ungrammaticality with possessors, and both are missing the optional nominal complement. To reflect this, I proposed an analysis where all examples of bare demonstratives or *which* (without the noun) were the result of NP Ellipsis. Under this approach, these items always take nominal complements, and when the NP doesn't appear in the surface form it's because it elided. I could then unify both restrictions as simply a constraint against ellipsis sites appearing to the immediate left of [POSS].

This proposal has a number of negative consequences, both theoretical and empirical. In terms of the theory, it commits us to saying that all examples of the demonstrative pronouns involve deletion, even when they occur in discourse initial position. Without a linguistic antecedent, the deleted element must be some abstract pronominal NP, but it is not clear exactly what this means. For this reason, assigning demonstrative pronouns to the category of NP Elided DPs appears to bleach NP Ellipsis of much of its theoretical meaning.

More importantly, this proposal makes the wrong predictions. If *that* and *which* always take nominal complements, then the strong version of this proposal says that no determiner takes an optional complement—determiners in English either have an obligatory complement, or they never have a complement. This prediction is falsified for *one*, *neither*, *other*, and *another*, along with a handful of determiners that exhibit inter-speaker variation. These determiners have a complement that sometimes appears, but they can be possessors with or without this complement.

- (40)
- a. There were three cars in the parking lot, and one (car)'s tires were slashed.
  - b. Neither (student)'s ideas were very good, in fact.
  - c. We must respect other (people)'s ideas.
  - d. He was seeking solace in another (woman)'s arms.

We could back off from this stronger proposal, and say that *neither* and the others take optional complements, while still maintaining that the complement to *that* is obligatory. Still, this view is not very intuitive.

Yet another reason this proposal fails involves complex possessors. If the restriction involves ellipsis of a required NP complement, then *that* is really *that NP*. This means a complex NP ending in *that* ends in an ellipsis site, and so it could never be a possessor. We already discussed a counterexample to this claim, in example (9), repeated below.

(41) (Pointing to a gadget) I'd like [<sub>DP</sub> the owner of *that* NP] 's salary!

Because (41) is grammatical, an approach based on ellipsis sites and *that* always taking a complement fails.

Also, this approach does not extend well to *its*. The pronoun *it* does not take a nominal complement ever, so to make it match this analysis, more invisible items would have to be posited. There would have to be a silent element between *it* and [POSS], and this element would have to be elided only in those situations where *its* occurs in the independent form. This particular analysis is extremely far fetched.

One final reason to think that the NP Ellipsis and morphological gap examples may be different phenomena is that I have come across some examples of possessive NPE, but I have never come across any examples of *\*that's*.

(42) (Found on a billboard) Every baby has a story. Tell us yours'.

This argument is not fool-proof, however, because there are also examples of native English speakers using *which's*.

(43) Do you happen to know if—gosh, I've forgotten his name—from the zoo film unit is still operating at that little film studio which's name I've also forgot?<sup>11</sup>

## 8 Learnability

One possible criticism of flag-throwing Vocabulary Insertion rules involves how they might be learned by a child. While learners of English almost never hear cases like *\*that's cover*, they also never hear a great deal of other possessive forms. Still, children are able to form a general rule for possessives, and they somehow learn that *that* cannot participate in this general rule. How are they able to do so with only positive evidence?

The answer to this puzzle has to do with the structure of the English pronominal system. Most of the pronouns have irregular possessive forms (e.g. *my*, *your*, *their*, but not *its*, *whose*), and the existence of these irregular possessive forms forces the learner to posit different Vocabulary Insertion rules for possessive pronouns. There is not simply one rule for possessives, rather there is a general rule and a set of specific rules, the specific rules all being used for pronouns. This might cause the language learner to go a step further and assume that **all** pronouns must have specific Vocabulary Insertion rules, even those that appear on the surface to be the result of a general rule. If a pronoun doesn't have a Vocabulary Insertion rule, then it must be actively ruled out. This assumption, combined with the fact that we are dealing with a closed-class set of items, allows the lack of data to be evidence to the learner that demonstrative pronouns cannot be possessors. Under this view, the child never hears *\*that's cover*, and therefore cannot posit a normal Vocabulary Insertion rule. The child also cannot use the general rule because of the assumption that pronouns all correspond to their own (non-general) Vocabulary Insertion rules. The end result is that the child adopts a flag-throwing Vocabulary Insertion rule. This is similar to

<sup>11</sup>Jane Goodall, *Beyond Innocence: An Autobiography in Letters : the Later Years*, page 116, by way of Wiktionary (<http://en.wiktionary.org/wiki/which's>, accessed 29 Apr 2008)

the stipulated restrictions in Sections 2 and 3, but it is incorporated into the learning theory as opposed to the rule/constraint system. This explanation also has more of a functional basis than the stipulated restriction on pronouns, because it is grounded in the distinction between open-class and closed-class items.

The learning theory outlined above is dependent on phonological motivation. It is precisely because *my* is not pronounced *me's* that a learner of English posits specific Vocabulary Insertion rules. In a language without this morpho-phonological distinction in possessive forms, a single general rule should be sufficient. There would be no chance for the learner to extend the **existence** of specific rules for pronouns to the **requirement** that pronouns have these specific rules. Therefore, the learning theory predicts that such a language cannot contain the same restriction on possessive demonstratives that English has.

The same line of thinking that allows for children to learn that *\*that's* is ungrammatical can be extended to *its*. The third person non-human pronoun has a dependent possessive form, but no independent one. It is precisely because some pronouns vary in morphological form for dependent and independent contexts that a gap like this is possible. The learner, seeing forms like *my* and *mine*, notes that pronouns sometimes require different Vocabulary Insertion rules depending on whether the possessed noun is overt or not. This extends to a requirement that there be positive evidence that a pronoun has both forms, and if no positive evidence is met, the learner adopts a flag-throwing Vocabulary Insertion rule.

The approach taken in this paper would allow any element to have a gap in the possessive form. All that is needed is a flag-throwing Vocabulary Insertion rule preventing that form from appearing in the possessive, and this is possible for open-class and closed-class items. What restricts this type of gap to closed-class items is the learning algorithm: a flag-throwing rule for an open-class item can be stated in the theory, but it would be unlearnable.

A different type of morphological gap is explored in Albright 2006, where gaps of open-class items are analyzed. Under Albright's analysis, different competing ways of conjugating or declining a lexical item, combined with a low frequency of use, can sometimes result in a morphological gap. One example given involves Spanish present tense verbs.

(44) Spanish present tense for *abolir* 'abolish'

1sg: —	1pl: abol-ímos
2sg: —	2pl: abol-ís
3sg: —	3pl: —

The 1sg form of present tense verbs is formed with the suffix *-o*. There is a complicating factor, though, because many verbs of this form will diphthongize the stem's [o] vowel when it becomes stressed. The infinitive, 1pl, and 2pl forms have stress on the suffix, so given only those forms, we don't know how the verb will behave in the other forms. *Abolir* in 1sg would either have a diphthongized vowel on the stress (*abuélo*) or not (*abólo*), and there is insufficient evidence to distinguish them, according to Albright. Therefore, Spanish speakers are either unsure about what the form should be, or they reject it outright.

Albright's approach cannot be readily adapted to *\*that's* because the restriction on demonstratives as possessives has nothing to do with phonology. If there were a pronoun similar to *that* phonologically, and that pronoun's possessive form looked different from the general 's rule, then the situation would be analogous. Say, for instance, that English had

a 2pl pronoun *yat* /jæt/ with the possessive *yate* /jert/. Then English speakers would not know to produce the possessive as *that's*, according to the general rule, or *thate* /ðert/, as an analogy to the proposed *yat*, *yate* paradigm. Because this is not the case, confusion based on paradigm uniformity is not a likely candidate for an explanation of this particular phenomenon.

## 9 Conclusion

We have investigated the morphological gaps of possessive pronouns in English, with two primary proposals within the Distributed Morphology framework. The first proposal, a translation of the simple Lexicalist analysis, locates the gap in List 1, the narrow lexicon that the Syntax takes from. The second proposal locates the gap in List 2, the Vocabulary Insertion rules. Each proposal has positive and negative consequences, and in my opinion neither one is a clear winner. This paper has spent more time investigating the second proposal, mostly because it is the more novel and interesting one.

Given the goal of having a similar Syntactic analysis for possessive pronouns and regular possessive DPs, then something like flag-throwing Vocabulary Insertion rules are necessary to be empirically accurate. On the other hand, given a dispreference for filters and ungrammaticality features, then the two types of possessive DPs must have different Syntactic structure. Whether the gap is stored in List 1 or List 2 has a profound impact on the whole morpho-syntax of English pronouns. The choice between the two becomes an important issue with the adoption of DM and its distributed lexicon.

That being said, it seems like either direction we go, we run into problems. There does not appear to be an elegant and principled way to encode these types of morphological gaps in a Distributed Morphology framework. That is fine if DM is simply a tool we use to encode general principles of morpho-syntax in natural language. But if we take seriously the idea that DM can model the morpho-syntactic behavior of an entire grammar, then we need to be extremely clear how small idiosyncratic aspects of the grammar are formalized.

The claim that both analyses have in common is that the gap is not principled. In other words, it must be stored in some list or other, but it cannot be reducible to a larger principle of English grammar. We predict that other languages will have various unpredictable gaps in non-human possessive forms. Further research into the typology of these gaps could support this prediction, but whatever the results may be, a mechanism like the ones described here will still be necessary to account for the English data.

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