

The Unextractability of English Possessive Pronouns: On Portmanteau Formation and the Syntax-Morphology Connection*

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Abstract: This paper examines a constraint on the extraction of possessors in English, which previous research has shown to be acceptable in the colloquial language of some speakers. While such speakers allow extraction of full DP possessors, here I investigate the further fact that such speakers reject extraction of possessive pronouns. I argue that this syntactic fact, as well as certain morphological details about English possessors, are explained by the hypothesis that English possessive pronouns are portmanteau morphemes which are immobile due to corresponding to a non-constituent/non-phrasal unit. I also argue that this result leads to the further conclusion that morpho-phonological evaluation via phase *spell-out* applies to entire phases at once, not only to phase complements. These results clarify English-specific puzzles about possession, provide further support for the proposal that one morpheme can correspond to multiple syntactic nodes, and deepens our understanding of how the syntax-morphology interface functions.

Keywords: syntax, morphology, possession, extraction, portmanteau, spell-out

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1 Introduction

In this paper, I examine new facts about English possessive pronouns and their interaction with syntactic movement, which are of significance for several topics in morpho-syntax. I argue that these findings clarify English-specific puzzles about the morpho-syntax of possession, and deepen our understanding of the general principles that govern the relationship between the syntactic and morphological components of the grammar.

This paper extends research by Davis (2020b, 2021b), who shows that many English speakers are capable of a form of possessor extraction in colloquial speech. This extraction separates the possessor from the Saxon genitive morpheme [’s] and the rest of the possessed DP, which are stranded in a lower clause as in (1) below.

- (1) *English possessor extraction* (Davis 2021b:295–296, ex. 9)
- a. *Main clause question*
Who₁ do you think [[*t*₁’s **kid**] ate the most cake]?
 - b. *Embedded question*
I can’t remember [**who**₁ I said [[*t*₁’s **friend**] is coming over]].
 - c. *Relative clause*
This is the student [**who**₁ they suspect [[*t*₁’s **answers**] were copied]].
 - d. *Free relative*
I’ll speak to [**whoever**₁ you suggest [[*t*₁’s **idea**] is the best]].
 - e. *Cleft*
It’s Michelle [**who**₁ we heard [[*t*₁’s **cat**] is the cutest]].

Davis describes and analyzes a number of restrictions on this extraction, such as the fact that it must be cross-clausal as in (1), but demonstrates that it is nevertheless fully productive. Above we see that such extraction can be achieved by all forms of *wh*-movement. Additionally, many speakers also accept possessor extraction by topic/focus fronting. The subject of this paper is a deeper investigation of topic/focus possessor extraction, and certain important limitations of it.

The research reported in the present paper examined this phenomenon further by identifying speakers who corroborate the judgments reported in Davis (2020b, 2021b), and using a questionnaire containing a list of relevant test sentences to elicit additional judgments from those speakers about possessor topic/focus fronting. Ultimately, of 17 speakers who accept possessor extraction via *wh*-movement as in (1), 14 consulted in this research judged possessor topic/focus extraction as in (2) to be acceptable. These test sentences are designed to set up a clear sense of contrast in order to make use of topic/focus fronting as natural as possible.

- (2) *Possessor topic/focus fronting*
- a. I don’t think John’s cat is particularly cute, but **Mary**₁, I’ve always said [*t*₁’s cat] is really adorable.
 - b. My dog is always well behaved. But [**that guy**]₁, I think [*t*₁’s dumb noisy dog] should get kicked out of the park.
 - c. Your mom is, unfortunately, not a great cook. [**My mom**]₁, however, I suspect [*t*₁’s cooking] could win prizes.

Importantly in contrast, these 14 speakers judged fronting of possessive pronouns to be degraded (3):¹²

¹Analogously, the remaining 3 speakers who rejected possessor topic/focus fronting as in (2) reported that such extraction is possible in cleft sentences, but importantly not for possessive pronouns. See footnote 12 below for further discussion.

²Of the 14 speakers who corroborated the core contrast between (2) and (3) rated the configuration in (3) as marginally acceptable, though worse than (2). Since the majority of speakers do not have this judgment, I will not analyze this point of variation here.

³All the examples in (3) are acceptable if the possessum is pied-piped in the usual way (i):

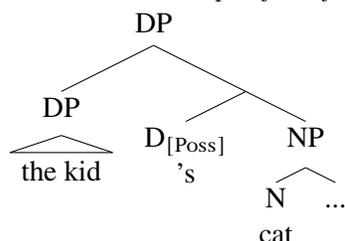
- (3) *No extraction of possessive pronouns by topic/focus fronting*
- *Your cooking is, unfortunately, not great. **My**₁, however, I suspect [*t*₁ cooking] could win prizes.
 - *I don't think John's cat is particularly cute, but **our/your**₁, I've always said [*t*₁ cat] is really adorable.
 - *My dog is always well behaved. But **his/her/their**₁, I think [*t*₁ dumb noisy dog] should get kicked out of the park.

I argue that this contrast and related facts that we will see later on sharpen our theories of both English possession, and more general topics about the nature of the syntax-morphology relationship. These findings also show how non-standard grammatical phenomena, even in a well-studied language like English, can provide a unique window into the grammar which enriches our understanding of it. Next I summarize the two main proposals of the paper.

1.1 Proposal #1: English possessive pronouns are immobile portmanteau morphemes

The first main proposal of this paper is about the morpho-syntax of English possessive pronouns. I will assume following previous literature (Abney 1987; Corver 1992; Chomsky 1995b; Munn 1995) that English possessors are externally merged in the specifier of D, and that in the presence of typical possessive phrases this D is realized as ['s]. The structure in (4) below demonstrates this:

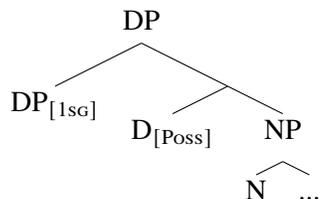
- (4) *Possessor DP in specifier of ['s]*



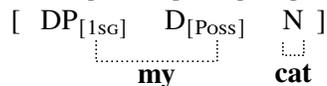
In contrast, building on Hudson (2003) and Deal (2006) I argue that English possessive pronouns like *my*, *your*, etc. are portmanteau morphemes, which simultaneously express multiple syntactic nodes. Specifically, I argue that these morphemes express both the possessive D and the possessor in its specifier, as in (5) below:

- (5) *Possessive pronoun portmanteau*

- a. *Structure*



- b. *Corresponding morpho-phonological form*



- (i)
- Your cooking is, unfortunately, not great. [**My cooking**]₁, however, I suspect *t*₁ could win prizes.
 - I don't think John's cat is particularly cute, but [**our/your cat**]₁, I've always said *t*₁ is really adorable.
 - My dog is always well behaved. But [**his/her/their dumb noisy dog**]₁, I think *t*₁ should get kicked out of the park.

I formalize this proposal using the Distributed Morphology theory (Halle and Marantz 1993; Harley and Noyer 1999; Embick and Marantz 2008, a.o.). In this theory, syntactic structures originate as abstract representations that lack morpho-phonological information, which is assigned after the structure is built. This assignment is achieved by a list of language-specific Vocabulary Insertion (VI) rules, which state when a given morpheme is assigned to a given syntactic node, as we'll see. It is usually assumed that VI rules may only assign a morpheme to a single node. There are, however, situations where a single morpheme appears to express multiple syntactic nodes, in 'portmanteau' fashion. This paper discusses precisely such a case. To achieve portmanteau formation, I will adopt the *spanning* hypothesis, which allows a morpheme to express multiple adjacent nodes at the same time (Bye and Svenonius 2012; Merchant 2015; Haugen and Siddiqi 2016; Svenonius 2016; Middleton 2020; Davis 2021a). This operation can create configurations like that in (5) above, where the possessor and possessive D are expressed together via one morpheme.

This analysis correctly predicts the immobility of English possessive pronouns as in (3) above, for the following reasons. Notice that a possessor and a D whose specifier it occupies do not form an exclusive syntactic constituent: the only phrase that contains both of those elements is the possessive DP as a whole, as we see in (4/5a) above, though this node also contains NP. If English possessive pronouns are indeed portmanteau morphemes that simultaneously express a possessive D and the possessor in its specifier, then such pronominal morphemes do not correspond to a constituent. Thus such pronouns should be immobile, since processes like *wh*-movement and topic/focus fronting are forms of phrasal movement, which cannot apply to non-constituents/non-phrases. We have seen above that this is the right prediction.

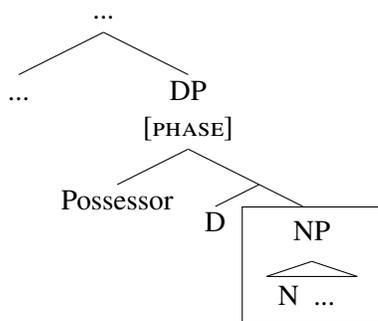
Much literature using Distributed Morphology achieves portmanteau formation by the post-syntactic operation *fusion*, rather than the relatively new spanning hypothesis. I will show that a fusion analysis also makes the right predictions about English possessive pronouns. Additionally, I will argue that either a spanning or fusion analysis leads us to the second main finding of this paper, summarized next.

1.2 Proposal #2: Simultaneous spell-out of whole phases

The second main proposal of this paper is about how syntactic derivations relate to the morphological component of the grammar. Much recent work has argued that the derivation of a sentence proceeds in chunk-by-chunk or cycle-by-cycle fashion. A great deal of evidence for this hypothesis comes from findings about the punctuated ('successive-cyclic') nature of movement processes (Chomsky 1973, 1986; McCloskey 2000; Nissenbaum 2000; Sauerland 2003; Wiland 2010; Abels 2012; van Urk and Richards 2015; Davis 2020a, and many more). Recent research in this vein largely follows Chomsky (2000, 2001) in attributing such effects to *phases*, a set of special phrases generally taken to include CP, vP, and often DP. Phases have the unique characteristic of triggering the operation *spell-out*. This operation causes the structure built so far to be evaluated by the morpho-phonological and semantic components of the grammar, and also establishes certain limitations on the length of syntactic operations. Through phase-by-phase applications of spell-out, the meaning and pronounced form of a given structure are incrementally established. Recent research using Distributed Morphology has advanced this proposal, arguing that spell-out and thus morpho-phonological processes like stress assignment, allomorphy, and thus VI rule application, are indeed triggered phase-by-phase (Marvin 2003; Embick and Marantz 2008; Newell 2008; Embick 2010; Newell and Piggott 2014; Moskal 2015; Moskal and Smith 2016). However, the exact nature of spell-out is still a topic of debate in current research. In this paper, I adjudicate between two competing theories about spell-out.

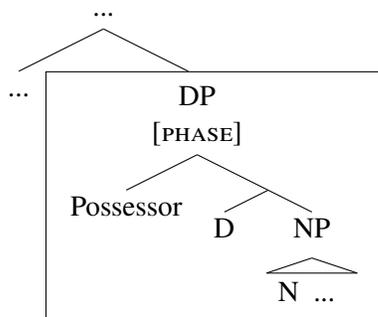
The widely-adopted version of phase theory in Chomsky (2000) hypothesizes that once a phase is built, spell-out applies to its complement. In this paper I will argue that DP is a phase (Bošković 2005, 2016; Newell 2008; Newell and Piggott 2014; Syed and Simpson 2017; Simpson and Park 2019, a.o.). For Chomsky (2000), if DP is a phase, then when a DP is built its NP will spell-out as in (6) below, and be subject to VI rules. Notice that the D head and a possessor in spec-DP are not subject to spell-out at this time. Here and in subsequent trees I occasionally use boxes to demarcate where spell-out applies:

(6) *Phase theory #1: When DP is built, only NP spells-out*



There is another theory about the nature of phase spell-out advanced in the *Cyclic Linearization* theory, which a parallel strand of research over the last two decades has amassed arguments in favor of (Fox and Pesetsky 2005a,b; Ko 2007, 2011, 2014; Sabbagh 2007; Jenks 2011; Medeiros 2013; Overfelt 2015; Erlewine 2017; Davis 2020a, a.o.). Primarily based on facts about word order and its interaction with movement, works in this vein argue that phase-level spell-out applies to each phase in its entirety as soon as it is completed. This theory thus makes the prediction that as soon as a DP is built, all of its content will be assigned morphological form—including D and a possessor in its specifier, if present:

(7) *Phase theory #2: Simultaneous spell-out of the entire DP*



In this paper, I will argue that the second of these two theories of spell-out is correct. In brief, I will show that if spell-out only applied to phase complements, then we would predict certain patterns of pronominal possessor extraction that are in fact unattested. In contrast, full-phase spell-out makes the right predictions.

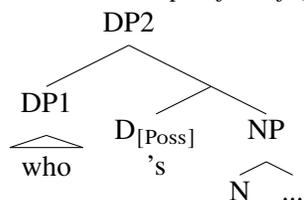
1.3 Contents of the paper

Section 2 provides background on the syntax of possession and the extraction of possessors. Section 3 presents the analysis of possessive pronouns as portmanteau morphemes which correspond to unextractable non-constituents, using the spanning hypothesis. Section 4 discusses additional facts which I argue reveal that phases spell-out all at once, and that DP is a phase. Section 5 shows that an alternative analysis using fusion is also tenable. Section 6 concludes.

2 Background on possessor syntax and possessor extraction

As mentioned above, I follow previous work in assuming that a possessor DP sits in the specifier of a possessive D, whose usual form is [*'s*]. Under this analysis, the word *whose* consists of the *wh*-phrase *who*, and the possessive D which it is in the specifier of (8):

(8) ‘Who’ in the specifier of [’s]



This account predicts the well-known fact that *whose* cannot be extracted, as shown in (9) below. This is because this word corresponds to two elements that do not form an exclusive constituent—the possessive D and its specifier. Therefore we expect *whose* to be immobile, as pointed out by Corver (1992).

(9) No extraction of ‘whose’

- a. * Mary is the author [_{CP} **whose**₁ they said [[_t₁ **new book**] is good]].
- b. * **Whose**₁ did you say we should buy [_t₁ **cookies**]?

For the same reason, any other possible combination of possessor DP and [’s] cannot be extracted:

(10) No extraction of DP+[’s]

- a. * [**Which kid’s**]₁ should we buy [_t₁ **cookies**]?
- b. * **Timmy’s**₁ we should buy [_t₁ **cookies**].

My analysis of the unextractability of English possessive pronouns will use fundamentally the same logic as Corver’s solution for the unextractability of *whose*. In contrast, since a possessor in spec-DP is itself a constituent, we predict the possibility of extracting a possessor and stranding D below. As we saw above, in the colloquial register of some English speakers this prediction is verified, as (11) shows again.³

(11) English possessor extraction stranding [’s]

- Who**₁ do you think [[_t₁ ’s **kid**] ate the most cake]? = (1a)

Davis (2020b, 2021b) argues that such extraction is truly what it appears to be using a variety of diagnostics, including islands, and applies several tests to demonstrate that this is not an illusion caused by use of DP-internal parentheticals, which are illicit in English regardless (Emonds 1976).

Possessor extraction is available in languages like Hungarian (Szabolcsi 1984) or Tzotzil (Aissen 1996) as well as the Slavic languages (Bošković 2005, a.o.). It has generally been taken for granted that possessor extraction is impossible in English, and this is indeed so for many speakers. Previous research has argued that the typical absence of possessor extraction in English is due to a phonological requirement which rejects movement that separates a possessor from the possessive D (Chomsky 1995b; Radford 1997; Gavruseva 2000; Gavruseva and Thornton 2001, a.o.). Indeed, Gavruseva argues that adjacency requirements of this sort play an important role in limiting possessor extraction cross-linguistically. Building on this work, Davis (2020b, 2021b) proposes that what distinguishes English grammars that do and do not allow possessor extraction is the timing of a phonological adjacency requirement of the clitic [’s]. Davis argues that this requirement has a weaker effect in possessor-extracting grammars, which makes extraction possible but restricted. One such detail noted in the introduction is that such possessor extraction must cross a clause boundary (see Davis 2021b, p. 296, ex. 11.) I have controlled for this in the sentences analyzed in this paper.

As we saw in the introduction, topic/focus fronting can extract a possessor. But we also saw that this

³Of course, *who* is arguably a pronoun. The account I will offer in this paper does not predict that possessive pronouns should be generally unextractable: this constraint should only hold for possessive pronominal morphemes that express a non-constituent. Since *who* is not a portmanteau, its extractability is expected. As we’ll see, since it happens to be the case that non-*wh* possessive pronouns in English are portmanteau morphemes, they are immobile.

is not possible for possessive pronouns. There would be no puzzle here if English pronouns were generally incapable of topic/focus fronting, but this is not so, as (12) demonstrates:

- (12) *Topic/focus fronting usually possible for English pronouns*
- a. I don't like you, but **him**₁, I like *t*₁.
 - b. Mary is very well-groomed, but **you**₁, I think should *t*₁ bathe a lot more often. You stink!
 - c. I don't care how you talk to other people, but **me**₁, you gotta respect *t*₁! I'm the boss!

Therefore the unextractability of English possessive pronouns is a genuine puzzle.⁴ In the next section, I argue that this fact is correctly predicted by the hypothesis that English possessive pronouns are portmanteau morphemes that correspond to non-constituents, and thus are immobile.

3 The non-constituent portmanteau analysis

While full DP possessors in English are immediately followed by [*'s*], most possessive pronouns clearly occur without this morpheme (though see footnote 5 on *his* and *its*).⁵

- (13) *English possessive pronouns*
- a. my(*'s) food
 - b. our(*'s) food
 - c. your(*'s) food
 - d. his food
 - e. her(*'s) food
 - f. its food
 - g. their(*'s) food

Deal (2006) discusses two potential analyses of this fact: morphological merger of [*'s*] with the pronoun (Hudson 2003), or deletion of [*'s*] in the presence of a pronoun (Huddleston and Pullum 2002). Next I discuss the predictions of these proposals, rephrasing them slightly to be compatible with the hypothesis that [*'s*] corresponds to D. As previewed above, I argue for a version of a morphological merger analysis.

⁴Also note that extraction of pronominal possessors is acceptable in other languages such as Russian (i). This fact deepens the puzzle of why pronominal possessor extraction is banned in English.

- (i) *Pronominal possessor extraction in Russian* (adapted from Bondarenko and Davis (To appear) ex. 31)
- Eš/ego₁ Lena ne vzjala s soboj [*t*₁ otkrytku]
 her/his Lena NEG took with self card
 'Lena didn't take [her/his card] with her

⁵The only possessive pronouns for which the absence of [*'s*] is unclear are *his* and *its*. We might decompose these into *he* + *'s* and *it* + *'s*. If this is the case, then we should be able to extract *he* or *it*, stranding [*'s*] below. As (i) shows, this is in fact impossible:

- (i) a. * I don't think Mary's cat is particularly cute, but take a look at John's. **He**₁, I've always said [*t*₁ 's cat] is really adorable.
 b. * Your computer is slow, but mine is very fast. **It**, I think [*t*₁ 's processor] costs more than your car.

In the context of the analysis presented here, this fact indicates that *his* and *its* are not synchronically decomposable, but rather are portmanteau forms just like the rest of the possessive pronouns under consideration here. Consistent with this analysis is the fact that *his* and *its* cannot be fronted. For the first of these elements, we have seen this fact in (3c) above. For the latter, see (ii):

- (ii) * Your computer is slow, but mine is very fast. **Its**, I think [*t*₁ processor] costs more than your car.

The /s/ in *his* and *its* may be historically related to [*'s*], of course, but I maintain that this resemblance is now simply vestigial.

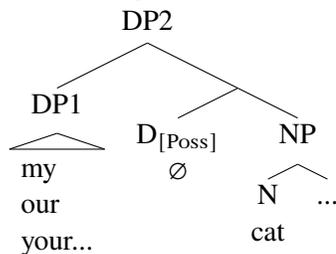
3.1 Against a deletion analysis

First I will discuss why an [’s]-deletion analysis does not make the correct predictions. The hypothesis that [’s] deletes in the presence of a pronoun can be re-cast as a contextual allomorphy proposal. In Distributed Morphology, rules of contextual allomorphy are described using VI rules that are specified to assign a particular morpho-phonological form to a given node only when it is in a particular context. When that context is not present, a default (‘elsewhere’) VI rule applies instead. The relevant VI rules for the [’s]-deletion hypothesis under consideration are shown in (14) below. The rule in (14a) states that the possessive D receives the null realization /∅/ when to the right of a pronoun, and the rule in (14b) states that the possessive D is expressed as [’s] otherwise:

- (14) *VI rules for possessive D in English assuming pronouns trigger use of null D*
- a. $D_{[Poss]} \leftrightarrow \emptyset / [\text{Pronoun } _]$ (context-sensitive allomorphy rule)
 - b. $D_{[Poss]} \leftrightarrow 's / \text{elsewhere}$ (applies by default if the above rule fails)

If the disappearance of [’s] in the presence of a pronoun is due to a rule like (14a), then the morpho-syntactic structure for a DP containing a possessive pronoun would be as in (15) below. Here we see a possessive pronoun sitting in the specifier of DP, whose head is silent due to the above allomorphy rule.

- (15) *Possessive pronoun and silent D (Incorrect analysis)*



I argue that this analysis does not make the right predictions. Notice that if English possessive pronouns simply correspond to constituents sitting in the specifier of a coincidentally silent D, there is no syntactic or morphological reason why such possessors should not be extractable. However, we have seen that unlike other possessors, these possessive pronouns are unextractable. I will therefore pursue a different analysis.

3.2 In favor of a non-constituent portmanteau analysis

Deal (2006) cites Hudson (2003) for the proposal that English possessive pronouns and [’s] are united via a process like contraction or morphological merger. I argue that an analysis in this vein which treats English possessive pronouns as portmanteau morphemes makes the correct syntactic predictions.⁶ Given the precedent for considering [’s] a realization of possessor-selecting D, it is necessary to state that the relevant morphological merger operation creates a portmanteau form that expresses a non-constituent syntactic unit, consisting of a possessive D and the possessor in its specifier. Neither Deal nor Hudson discuss in detail

⁶Deal (2006) argues that a deletion analysis captures the fact that some speakers permit forms like *your all’s*, which she suggests involve the pronoun receiving genitive morphology, with the intervening *all* bleeding the rule that would normally delete [’s]. Deal notes that not all speakers allow such forms, and thus suggests that speakers vary between using deletion or morphological merger. If the extraction ban I focus on also holds for speakers who are capable of possessor extraction and who allow forms like *your all’s*, this would suggest that the morphological merger analysis is universally correct. This would entail that another factor is responsible for the forms Deal observes. One possibility is that these forms are exceptions that are not the result of regular morphological rules. As this hypothesis leads us to predict, the use of the possessive pronoun with [’s] in several other analogous contexts is clearly illicit:

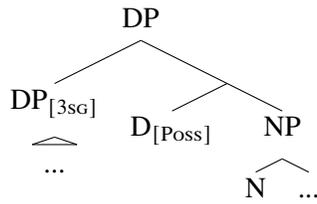
- (i) a. You/***your** people’s ideas are all nuts. b. You/***your** two’s cake was the best one at the picnic.

how the morphological merger analysis should be implemented. As previewed above, I will do this with Distributed Morphology, along with the proposal that a single VI rule can simultaneously express multiple adjacent syntactic elements—a phenomenon termed *spanning* (Bye and Svenonius 2012; Merchant 2015; Haugen and Siddiqi 2016; Svenonius 2016; Middleton 2020; Davis 2021a). For concreteness, I will also assume that word order assignment (linearization) precedes the application of VI rules (Embick 2010; Arregi and Nevins 2012; Haugen and Siddiqi 2016; Ostrove 2018, a.o.). See Haugen and Siddiqi (2016) for arguments that spanning (and all VI) indeed applies to the output of linearization.

As discussed above, I assume that usual possessive DPs sit in the specifier of a D realized by its default form [*'s*], as the derivation below shows explicitly:

(16) *Typical possessive structure*

a. *Build structure*



b. *Linearize*

[DP_[3SG] D_[Poss] N]

c. *Assign form*

[DP_[3SG] D_[Poss] N]
Mary/who 's cat

Since the morphology of such possessors straightforwardly corresponds to a phrase in spec-DP, the extractability of such possessors is accurately predicted, as we've seen:

(17) *Extractability of typical possessors*

- a. **Who**₁ do you think [*t*₁'s kid] ate the most cake? =(1a)
 b. **Mary**₁, I've always said [*t*₁'s cat] is really adorable. =(2a)

The predictions differ for pronominal possessive morphemes, given the hypothesis that these elements simultaneously express a possessor pronoun and possessive D with a single portmanteau form. For concreteness, in (18) below I state the VI rules that describe the distribution of these portmanteau forms:

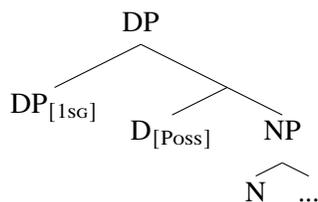
(18) *VI rules for English possessive pronominal morphology*

- a. [DP_[1SG] D_[POSS]] ↔ my
 b. [DP_[1PL] D_[POSS]] ↔ our
 c. [DP_[2SG/PL] D_[POSS]] ↔ your
 d. [DP_[3SG] D_[POSS]] ↔ its
 e. [DP_[3SG, M] D_[POSS]] ↔ his
 f. [DP_[3SG, F] D_[POSS]] ↔ her
 g. [DP_[3PL] D_[POSS]] ↔ their

A derivation involving such a portmanteau is provided in (19) below, which contains a first person singular possessor. First the abstract structure in (19a) is linearized as in (19b), after which the VI rule in (18a) above can apply to the adjacent nodes DP_[1SG] and D_[POSS] as in (19c), assigning them the joint form *my*:

(19) *First person possessive portmanteau derivation*

a. *Build structure*



b. *Linearize*

[DP_[1SG] D_[Poss] N]

c. *Assign form*

[DP_[1SG] D_[Poss] N]
 my cat

Since under this analysis *my* and the other possessive forms shown in (18) above do not correspond to a syntactic constituent, we accurately predict that they should be immobile, as we have seen in reality:

(20) *No extraction of possessive pronouns by topic/focus fronting* = (3a)

* Your cooking is, unfortunately, not great. **My**₁, however, I suspect [*t*₁ cooking] could win prizes.

This analysis also predicts the fact that the morpheme ['s] is absent from these possessive forms (though see footnote 5 above about *his* and *its*, which also behave as predicted). If a given syntactic node can only be morpho-phonologically expressed one time (Halle and Marantz 1993; Bobaljik 2000; Arregi and Nevins 2012; Coon and Keine 2020), then when a portmanteau possessive form realizes both D and a possessor, it will not be possible for D to be expressed independently. This fact could also be understood as an effect of the *Minimize Exponence* principle (Siddiqi 2009; Haugen and Siddiqi 2016), which prefers derivations that realize a given structure with the smallest possible number of morphemes.

3.3 More on portmanteau formation and pronoun structure

In most versions of Distributed Morphology, VI rules apply only to terminal nodes, and one morpheme cannot correspond to more than one node. My analysis for English possessive pronouns contradicts both of these hypotheses, since I argue that these morphemes subsume multiple syntactic elements: a head (D_[Poss]) and a phrase (the possessor DP). The hypothesis that morpho-phonological form can only be assigned to individual terminals has been challenged by works adopting spanning like those cited above, which I follow here in using spanning as a means of portmanteau formation. As usually defined, spanning can only apply to terminals that are structurally adjacent. If this is so, and if pronouns are fully-projected DPs, we may expect it to be impossible for a portmanteau to span across the possessive D as well as the D and/or N terminal(s) that are embedded inside of the possessive DP.

However, since pronouns are a closed class of functional items that plausibly lack a lexical core (NP), it may be that (English) pronouns are usually non-projecting determiners (following Postal 1969; Abney 1987; Baltin 2012).⁷ If so, spanning can indeed express both a possessor pronoun and the adjacent possessive D via

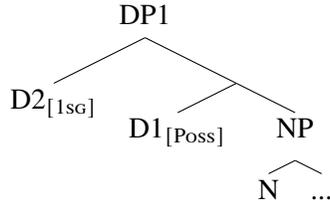
⁷See also Wiltschko (1998), who argues similarly that personal pronouns spell-out a functional head that lacks an NP complement. While my analysis necessitates a proposal of this variety for English (at least in the basic case), there is likely cross-linguistic variation in pronoun structure (Déchaine and Wiltschko 2002).

It is also possible that English possessive pronouns originate as full DPs, but are reduced to bare D heads via a process like *impoverishment* (Halle and Marantz 1993; Harley and Noyer 1999). Baltin (2012) argues for a deletion analysis of essentially this sort. In this situation, spanning can apply to the structurally reduced pronoun post-impoverishment.

a single portmanteau morpheme. This is what I will assume here, as (21) below illustrates.⁸ This structure is unconventional in the sense that the possessive pronoun, which here is a non-projecting head (D2_[1SG]), occupies a specifier position. However, under a *bare phrase structure* approach to labeling (Chomsky 1995a,b, a.o.), a non-projecting head behaves like a phrase due to being a (trivial) maximal projection, and thus should be capable of occupying a specifier position.

(21) *Possessive portmanteau derivation: Revised*

a. *Build structure*



b. *Linearize*

[D2_[1SG] D1_[Poss] N]

c. *Insert portmanteau via spanning*

[D2_[1SG] D1_[Poss] N]
 my cat

If heads are only capable of strictly local head-to-head movement (Travis 1984), and if pronouns are non-projecting determiners, we would expect phrasal movement of possessive pronouns to be independently ruled out. However, if pronouns are in general bare D heads, this cannot be correct: We've seen in (12) above that English pronouns are usually mobile. If non-projecting heads are trivial maximal projections with phrasal properties, they should in fact generally be capable of phrasal movement. Possessive pronominal morphemes in English are only immobile because, unlike other pronouns, they happen to correspond to non-constituents.

This concludes the core analysis of this section.⁹ Next, I demonstrate how this analysis extends to a method of adjudicating between theories of the nature and timing of spell-out.

⁸If the nodes expressed by spanning must be structurally adjacent, then we predict that a pronoun which is linearly adjacent to a possessive D, but embedded in additional structure, cannot trigger a portmanteau. I argue that this is what occurs in (i) below:

- (i) a. **The picture of ?them's/*their** frame is really ugly.
 b. You don't seem like yourself today. **The real ?you's/*your** cooking is much better.
 c. Won't you submit **little old ?me's/*my** cake to the baking contest?

⁹Another way of allowing one morpheme to correspond to multiple syntactic nodes is hypothesized in the Nanosyntax theory (Caha 2009; Starke 2009, a.o.), which allows morpheme assignment to terminal or non-terminal nodes (that is, X' and XP nodes). Nanosyntax is nevertheless capable of morpheme assignment only to constituent nodes, unlike spanning analyses. Nanosyntax assumes that traces are ignored by PF, and thus frequently appeals to movement to derive morpheme ordering. In the context of Nanosyntax, a portmanteau analysis of an English structure like *my cat* could be implemented as in (i). 1: Move NP to the edge of DP, thus creating another D' (D'2 below) containing just the possessor DP and possessive D. 2: Move D'2 to the top of the DP (thus creating a third D'). 3: Assign the morpheme *my* to the moved D'2, which now lacks NP, and assign *cat* to N.

- (i) a. [DP [NP N]₁ [D'2 DP_{1SG} [D'1 D_{Poss} t₁]]]
 b. [DP [D'2 DP_{1SG} [D'1 D_{Poss} t₁]]₂ [D'3 [NP N]₁ t₂]]
 c. [DP [D'2(=**my**) DP_{1SG} [D'1 D_{Poss} t₁]]₂ [D'3 [NP N(=**cat**)₁ t₂]]

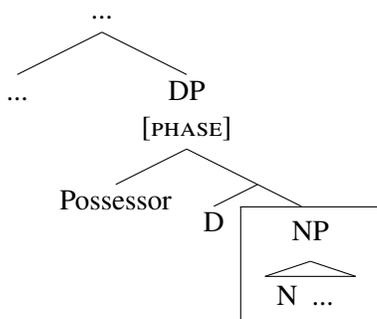
There is no independent evidence for the possibility of such movements within the English DP, and such short movements are expected to be impossible anyway given *anti-locality* (Abels 2012, a.o.), unless we posit a much richer DP structure. More importantly, in the context of this analysis the morpheme *my* corresponds to the constituent D'2, which must be mobile since the derivation just sketched vitally depends on movement of D'2. However, this wrongly leads us to predict that extraction of D'2 (and thus the morpheme *my*) from this structure should be legal, contrary to fact. A Nanosyntactic analysis is thus insufficient here.

4 Clarifying the timing of spell-out and the phase-hood of DP

As summarized in section 1.2 above, much research on the locality of syntactic and morpho-phonological operations has been gathered in support of the theory of phases. CP, vP and often DP are widely considered to be phases. Among other properties, these constituents trigger evaluation of the structure built so far by the components of the grammar that establish interpretation and morpho-phonological form. This process is termed *spell-out*. I argue that the English facts under examination reveal that DPs are phases, and also clarify the nature of spell-out.

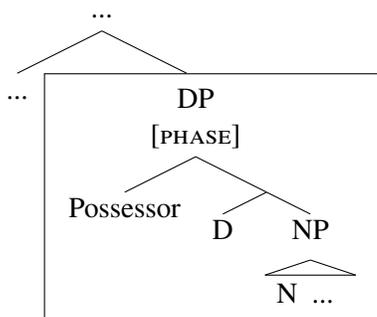
Above I summarized two variants of phase theory. Chomsky (2000) and much following work argues that when a phasal phrase is built, only its complement is spelled-out. For this theory, if DP is a phase then when a DP is built only NP is subject to spell-out, as diagrammed in (22) below. By hypothesis, after this process occurs only NP will have been assigned morpho-phonological form. The rest of the material in DP, including any possessor that happens to have been merged into spec-DP, will not be spelled-out until the next highest phase (presumably a vP or CP) spells-out:

(22) *Phase theory #1: When DP is built, only NP spells-out*



In contrast, work in the Cyclic Linearization theory following Fox and Pesetsky (2005a,b) argues that when a phase is built, all of its content spells-out and is thus evaluated by the morpho-phonological component of the grammar, as diagrammed in (23) below. This theory makes the prediction that as soon as a DP is built, all of its content will be assigned morphological form—including D and a possessor in its specifier, if present:

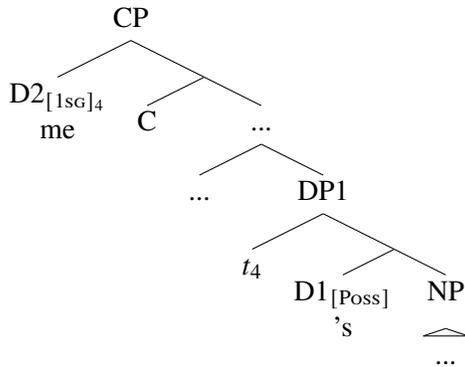
(23) *Phase theory #2: Simultaneous spell-out of the entire DP*



My analysis of the immobility of possessive pronouns in English adjudicates between these two phase theories. I have proposed that the possessive pronominal forms under discussion are portmanteau morphemes which express both a possessor pronoun and possessive D. In phase theory, and Distributed Morphology more generally, it is argued that morpho-phonological form is not assigned to syntactic material until it spells-out. This means that the portmanteau morphology that expresses D and the possessor will not be assigned until the time that spell-out applies to them. Recall that under the first version of phase theory described above, when a DP is built, only NP spells out. If this is so, D and its specifier will remain

un-spelled-out until the completion of a higher phase (vP, CP). Notice that under this analysis, we expect the possibility of extracting the possessor pronoun before portmanteau morphology is assigned. If movement separates the possessive D and possessor before they spell-out, we would expect them to both be realized with alternative morphology—presumably their default forms. For the possessive D, this is [*'s*]. For the extracted pronoun, this would be accusative morphology, which has been argued to be the default form that English pronouns take when no other form is available (Marantz 1991; Schütze 2001; Preminger 2014).¹⁰ The schema in (24) illustrates this prediction, which turns out to be incorrect:

(24) *Prediction of phase theory #1: Separated pronoun and possessive D receive default morphology*



In reality, 12 of 14 speakers who accept topic/focus extraction of full DP possessors (2) report that sentences matching the schema in (24) are unacceptable, as shown in (25) below.

(25) *Attempted possessor pronoun fronting with default morphology*

- a. *Your cooking is, unfortunately, not great. Me₁, however, I suspect [*t*₁ ('s) cooking] could win prizes.
- b. *I don't think John's cat is particularly cute, but us/you₁, I've always said [*t*₁ ('s) cat] is really adorable.
- c. *My dog is always well behaved. But him/her/them₁, I think [*t*₁ ('s) dumb noisy dog] should get kicked out of the park.

Recall once more that typical possessive pronouns are immobile, as we saw in (3), repeated in (26):

(26) *No extraction of possessive pronouns by topic/focus fronting*

- a. *Your cooking is, unfortunately, not great. My₁, however, I suspect [*t*₁ ('s) cooking] could win prizes.
- b. *I don't think John's cat is particularly cute, but our/your₁, I've always said [*t*₁ ('s) cat] is really adorable.
- c. *My dog is always well behaved. But his/her/their₁, I think [*t*₁ ('s) dumb noisy dog] should get kicked out of the park.

¹⁰Schütze points out that there are many heterogeneous environments in English where accusative case arises, evidently by default. Schütze shows that different languages use different cases as their morphological default, nominative being a common choice, though in English accusative is clearly required:

- (i) (From Schütze 1997, p. 54, ex. 65)
 - a. Him/*he liking beans surprised them.
 - b. It was us/*we.
 - c. Everyone but them/*they gets on John's nerves.
 - d. Who did it? — Me/*I.

In both (25) and (26), [*'s*] is placed in parentheses to show for the sake of completeness that such sentences remain unacceptable whether this morpheme is included, or omitted. Several speakers note that the configuration in (25) when including [*'s*] is less degraded than that in (26), though still unacceptable.¹¹ While the sentences in (3/26) should indeed be illicit due to involving impossible non-constituent movement, this issue should not apply to the sentences in (25).¹² I argue that the sentences in (25) are unacceptable due to a morphological timing problem rather than a syntactic one.

Recall that under the second version of phase theory mentioned above, when a DP is constructed it is entirely spelled-out. Under this theory, we predict that there will be no chance for the possessor pronoun to extract alone into a higher part of the clause before being spelled-out. Rather, the possessive D and the possessor pronoun in its specifier will be assigned their combined portmanteau form immediately when the containing possessed DP is built. I argue that this is why the extraction configuration in (3/26) cannot be repaired by using an alternative version with default morphology as in (25) above.

After spell-out, the pronominal possessor does not correspond to a free morpheme that can stand alone, since it has been realized jointly with D. I argue that for this reason there is no morpho-phonologically legal way to extract it. While the possessor sitting in spec-DP is extractable from a purely structural perspective, I suggest that later movement of the possessor cannot be linearized (see section 4.1 below for further discussion). Extraction of an entire portmanteau possessive form as in (3/26) would be morpho-phonologically legal, since these are free morphemes (*my*, *your*, etc.). However, these do not correspond to an exclusive constituent, so the syntax cannot extract them. While an alternative derivation resulting in default morphology as in (25) does not face a constituency issue, the timing of spell-out prevents such a sentence from being generated. In sum, then, if DPs are phases and phases fully spell-out all at once, we accurately predict that the attempts at possessive pronoun fronting in (25) and (3/26) above both will fail.

4.1 On the Phase Impenetrability Condition and post-spell-out movement

In Chomsky's phase theory, the syntactic material that spell-out has applied to is inaccessible for the rest of the derivation. This constraint is termed the *Phase Impenetrability Condition*, and is argued to motivate phenomena such as successive-cyclic movement. In contrast, the Cyclic Linearization theory, in which spell-out applies to entire phases all at once, does not posit a Phase Impenetrability Condition. If it did, it would wrongly predict the impossibility of movement from phases. Instead, this theory derives effects like successive-cyclic movement from considerations of linearization. See Ko (2014) for a thorough explanation of how this theory functions, and Martinovič (2019) for independent evidence that post-spell-out movement is possible. Note that since the Cyclic Linearization theory lacks a Phase Impenetrability Condition, it does not by itself ban extraction of a possessive pronoun that has undergone spell-out within the containing DP. The syntactic and morphological factors discussed above fill this explanatory gap.

¹¹ While 12 of 14 speakers who accept (2) rated the sentences in (25) as unacceptable, 6 of those 12 suggested that the violation in (25) is slightly less severe than that in (3/26). The remaining 2 of those 14 speakers judged that the examples in (25) are marginally acceptable. See footnote 13 below for further discussion.

¹² Gary Thoms (p.c.) points out that though for him possessor topic/focus fronting is somewhat degraded in the first place, possessor extraction via clefting is not (ia). He also points out that while clefting a full DP possessor as in (ia) is not degraded, it is impossible to cleft either a typical possessive pronoun (ib) or an accusative possessor pronoun (ic):

- (i) a. It's [my MOTHER]₁ that I suspect [[t₁'s cooking] could win prizes].
- b. *It's MY₁ that I suspect [[t₁('s) cooking] could win prizes].
- c. *It's ME₁ that I suspect [[t₁('s) cooking] could win prizes].

Of the 3 speakers mentioned in the introduction who do not accept topic/focus fronting for full DP possessors, 2 of them share the contrasts shown in (i) above, while the third accepts the contrast between (ia) and (ib), but states that (ic) is acceptable with [*'s*]. This speaker thus patterns like the 2 speakers mentioned in footnote 11 who marginally accept extraction of the form in (25). This pattern of contrasts for possessor extraction in clefts has the same distribution as the judgments for sentences involving non-clefting topic/focus extraction. These clefting facts can therefore be taken as additional evidence for the proposals of this paper.

With these considerations in mind, it is worth further discussing what exactly goes wrong if a possessor pronoun is extracted from spec-DP after its joint portmanteau morphology with D has been assigned. As mentioned above, this should be possible from a purely structural perspective, especially in the context of Cyclic Linearization where there is no Phase Impenetrability Condition. After spell-out and portmanteau assignment, the derivation has established that the possessive pronoun *my*, for instance, has been mapped to a sequence of nodes $[D_{[1SG]}, D_{[POSS]}]$, as illustrated in diagrams like (21c) above. There are at least two things that plausibly go wrong if we break that sequence by moving the possessor after spell-out.

On one hand, rendering $D_{[1SG]}$ and $D_{[POSS]}$ non-adjacent by post-spell-out movement removes the configuration that use of the portmanteau *my* requires: since this morpheme has already been assigned during the derivation, but is then no longer in an appropriate configuration for its use, the result would be a crash. Analogously, recall that spanning requires adjacency between nodes subject to simultaneous realization, which in this situation movement is breaking. Alternatively, possessor movement in this context may create a linearization ambiguity. The morpheme *my*, for example, corresponds to $D_{[1SG]}$ and $D_{[POSS]}$, but if these nodes become non-adjacent, a question arises about where to place *my*. Should it end up in the higher position corresponding to the moved possessor, or the lower position corresponding to the un-moved D? Either way, the position of *my* would be faithful to only one of the two nodes it is supposed to realize. Since there is no independent reason to favor one over the other, the result is an unresolvable ambiguity.¹³

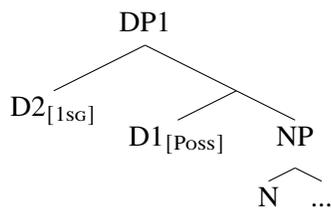
Yet another analysis would be to adopt the alternative theory of portmanteau formation described in the next section, for which movement after portmanteau assignment will fail for a purely syntactic reason.

5 An alternative analysis using fusion

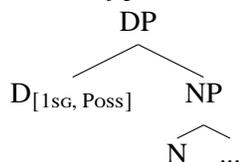
Since the origination of Distributed Morphology (Halle and Marantz 1993), much work using this theory derives portmanteau morphemes by a mechanism of *fusion*. This process unites multiple terminal nodes into one at spell-out before VI rules apply. Since fusion operates on terminal nodes, a fusion analysis would require adopting some version of the view that pronouns are non-projecting heads, as discussed in section 3.3 above. In the context of this analysis, it would be necessary to assume fusion of the possessor pronoun and the possessive D, as shown below:

(27) *Possessive portmanteau formation via fusion*

a. *Initial structure*

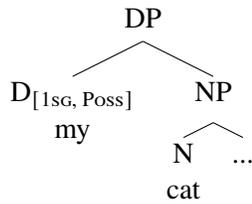


b. *Fusion of pronoun and possessive D*



¹³Recall that, as stated in footnote 11 above, 2 of 14 relevant speakers find the extraction configuration in (25) marginally acceptable. The fact that this configuration is less degraded for some speakers and accepted by 2 of them suggests that the morphological problem in (25) is less severe than the constituency problem in (3/26). The movement in (3/26) should be impossible due to the nature of movement, which operates only on constituents. However, the sentences in (25) could be generated via a sub-optimal morphological derivation—for instance, by overriding the portmanteau with default morphology after extraction.

c. *Morpho-phonological assignment*



Assuming that the constituent in question continues to be labeled DP post-fusion, here we are in a situation where DP is headed by a D that is the result of fusion of multiple elements. Since this fused D realized as *my* is the head of the DP, that head should be incapable of phrasal movement like topic/focus fronting, since (projecting) heads are only capable of strictly local head-to-head movement (Travis 1984, a.o.). In contrast as discussed above, under a *bare phrase structure* approach to labeling (Chomsky 1995a,b, a.o.) a non-projecting head is its own maximal projection and is thus capable of phrasal movement. Therefore if pronouns are generally non-projecting determiners, usual pronouns are correctly predicted to be capable of phrasal movement, as in (12) above. However, since the fused D in (27c) above does project, we correctly predict that the possessive pronominal morphemes expressing such a fused D cannot undergo topic/focus fronting. Thus we accurately predict the immobility of English possessive pronouns.

Fusion is a post-syntactic process that applies after spell-out but before VI rules. If the entire possessed DP spells-out as soon as it is built as argued in the previous section, then fusion of the pronoun and possessive D will apply before there is any chance to derive extraction of the possessor. Thus using fusion rather than spanning does not affect the fundamental arguments of this paper: under either approach, we accurately explain the unextractability of English possessive pronouns as a result of their portmanteau-hood, and we come to the conclusion that spell-out applies to the entire DP as soon as it is built.¹⁴

6 Conclusion

Usual DP possessors in English can be extracted by some speakers, and co-occur with [*'s*] (which they strand under extraction). In contrast, English possessive pronouns do not co-occur with [*'s*], and cannot be extracted even by English speakers usually capable of possessor extraction. I argue that these facts emerge from the portmanteau-hood of English possessive pronouns, whose morphology simultaneously expresses the possessive D and possessor in its specifier—a non-constituent unit.¹⁵ This result clarifies the nature of English possessive pronouns, while providing new evidence for the possibility of expressing multiple nodes with one morpheme. Taking this analysis to its logical conclusion also gives us reason to argue that DPs are phases, and that phases spell-out entirely all at once. This finding adjudicates between two competing phase theories in current research, and deepens our understanding of the syntax-morphology interface.

¹⁴As previous literature has noted, fusion has the problematic property of requiring the grammar to know which terminal nodes to fuse prior to the application of the relevant VI rule—in other words, a ‘look-ahead problem’ (Chung 2007a,b; Caha 2009, 2018). Nevertheless, I have shown that a fusion analysis is compatible with the arguments of this paper.

¹⁵I have argued that [*'s*] is absent from possessive pronominal forms because it and the possessor are realized together with one morpheme. However, in a post-nominal possession construction (ia) and an ellipsis configuration of similar form (ib) we see potential co-occurrence of possessive pronouns and [*'s*]:

(i) *Potential combinations of possessive pronoun and [*'s*]*

- | | | |
|----|---|--------------------------------|
| a. | a cat of mine / ours / yours / his / hers / theirs | (Post-nominal possession) |
| b. | Q: Is that a cat? A: Yes, mine / ours / yours / his / hers / theirs | (Possessor-stranding ellipsis) |

Regular phonological reduction will block the form *his's* by reducing the final sibilant cluster to a single [s], though the status of the irregular *mine* is not clear. As far as I know, there is no established theory about the structure of (ia) or why it resembles the ellipsis construction in (ib). Saying more about these examples would require further research which is beyond the scope of this paper.

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