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CONSTRAINTS ON OLD ENGLISH GENITIVE VARIATION*

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Abstract In Old English, nominal arguments are expressed using nouns inflected for genitive case, which can surface either before or after the matrix noun. The position of these 'genitive NPs' alternates between prenominal and postnominal position in early texts, but is mostly fixed to prenominal position in late texts, and therefore it qualifies as a potential case of grammar competition. In this paper, we study whether the rates of change are similar across different environments, or whether the position of genitive NPs is predictable given their weight or the presence of other elements, such as modifiers, in the matrix NP. We also investigate whether the change might have been favored by discourse processing considerations. We show that the position of genitive NPs is predictable when the NP consists of a single noun, or when the matrix noun is modified by other elements, and the variation is mostly limited to cases where genitive NPs contain elements in addition to the inflected noun. This shows that the genitive alternation is mostly driven by weight considerations, a phenomenon which has been identified in other cases of syntactic alternations. Discourse processing considerations also seem to partially predict the observed patterns.

1 Introduction

Syntactic alternations have been described as the result of a competition between different grammars (Kroch 1989), which produces S-curves when the relative frequency of one variety is plotted in a graph against time. In some instances, scholars have pointed to syntactic alternations which are not associated with different grammars, but can still exhibit S-shaped curves over

* The material and the R scripts used for this article can be found at https://github.com/AndreaCeolin/Constraints-on-Genitive-Variation. Many thanks to the editors of this volume and to three anonymous reviewers for all their work and their suggestions. Thanks to the people at the University of Pennsylvania who provided comments on this work: Hezekiah Akiva Bacovcin, Tad Rider-Bezerra, Ryan Budnick, Tony Kroch, Meredith Tamminga and Charles Yang. Thanks to Paola Crisma for sharing her dataset and to Cynthia Allen for some references. Thanks to the audiences of GURT2017 in Washington DC and DIGS20 in York (UK).

time (Tagliamonte & D'Arcy 2009). In particular, recent works have focused on Present-Day English (henceforth, PDE) genitive alternation, between *'s*- and *of*-constructions, as a case of syntactic variable which must be analyzed with reference to semantic (Stefanowitsch 2003), information (Biber 2003), weight (Rosenbach 2005), animacy (Rosenbach 2008), register (Jankowski & Tagliamonte 2014, Szmrecsanyi 2013) and phonetic (Jankowski & Tagliamonte 2014) factors.

We might ask whether looking at historical corpora, we can always distinguish between syntactic alternations which are a symptom of grammar competition, and alternations for which other explanations are required instead. Interestingly, the alternation between prenominal and postnominal genitive NPs can be traced back to Old English (henceforth, OE). In particular, while early OE manuscripts exhibit both prenominal and postnominal genitives, it has been noted that postnominal genitives were decreasing in frequency in favor of prenominal ones in late manuscripts. In the light of the recent work on PDE genitive variation, we might ask whether this change in frequency was the result of grammar competition in OE, or if this change requires other kinds of explanations.

In Section 2, we describe the OE genitive system drawing from the previous analyses by Allen (2008) and Crisma (2012). Section 3 summarizes the literature that studied the shift toward prenominal position in late texts, starting from Thomas (1931). Section 4 presents some possible analyses of the change and the results of a corpus search on the York-Helsinki Corpus of Old English Prose (YCOE, Taylor, Warner, Pintzuk & Beths 2003). The investigation focuses on noun phrases containing a genitive NP, where no modifiers are present in the whole phrase ('Light NPs'), and noun phrases that contain a modifier, either in the matrix NP ('Modified Matrix NPs') or in the genitive NP itself ('Heavy Genitive NPs'). Section 5 summarizes the results of the analysis, and concludes that the alternation is better explained with reference to animacy, weight and discourse processing considerations, rather than with a structural change.

2 Genitives in Old English

2.1 *Adnominal genitives*

In OE, genitive NPs with the function of nominal arguments or modifiers were expressed in a way which is comparable to, but different from, PDE.[1] Like in PDE, the language allowed the expression of nominal arguments on both sides of the nouns. The main difference is that while in PDE arguments are introduced either by the clitic *'s* or the preposition *of*, in OE they were

1 The boundary between arguments and modifiers is not always clear in genitive NPs. See Partee & Borschev (2003) for some discussion on PDE.

always case-marked. Although OE already had the preposition *of*, this was limited to partitive readings, and therefore could not be used to express possession or to introduce arguments (Thomas 1931, Mitchell 1985, Crisma 2012). As mentioned, adnominal genitives could occur to the left ((1)a-b) and to the right ((1)c-d) of the noun. Note that determiners and adjectives agree in case with the noun.[2]

(1) a. *He is* ***eal-ra*** ***cyning-a*** *cyning*
He is all-GEN.PL king-GEN.PL king
'He is the king of all kings' ACHom_I,1:178.8.8

b. *Forgang ðu* ***an-es*** ***treow-es*** *wæstm*
Forgo you one-GEN tree-GEN fruit
'Forgo the fruit of one tree' ACHom_I,1:181.79.74

c. *þæt cyrographum* ***ure*** ***geniðerung-e***
the writ our condemnation-GEN
'The writ of our condemnation' ACHom_I,21:348.81.4163

d. *þa digelnysse* ***þis-re*** ***ræding-e***
the mystery this-GEN text-GEN
'The mystery of this text' ACHom_I,23:366.29.4556

This system was not exceptional within Indo-European, because a similar system has been described for Latin (Crisma & Gianollo 2006) and Ancient Greek (Guardiano 2003) and it is, to some extent, preserved in modern German. Under the analysis provided in Lindauer (1998), Schoorlemmer (1998) and Longobardi (2001), modern German also allows two functional projections to license genitive case. The structure in Lindauer (1998) looks like (2), but the differences between the proposals are minimal.[3]

(2) $_{DP}$[**Gen1** $_{D'}$[D $_{AgrNP}$[AgrN $_{FP}$[**Gen2** $_{F'}$[F $_{NP}$[N]]]]]]

Since in these languages the head noun moves to an intermediate projection (AgrN, or Num, see Ritter 1991) to check its number and gender features, genitive NPs can appear in a prenominal position (Gen1) or in a postnominal

2 In the glosses, we only mark elements which are inflected for genitive case. They are in bold in the examples. The nouns to which they refer are underlined.

3 Lindauer has licensing of prenominal genitives happening at Spec,DP, while Schoorlemmer and Longobardi propose a dedicated projection (PosP and GenS, respectively). The projection that Lindauer arbitrarily defines FP is equivalent to Longobardi's GenO.

position (Gen2), exactly like in OE (Crisma & Gianollo 2006). From now on, 'prenominal genitives' will refer to genitive NPs in the Gen1 position, while 'postnominal genitives' will refer to those in Gen2.

From the translations in (1)a-b we see that, like in PDE, prenominal genitives do not co-occur with articles in definite readings. The article in front of the noun appears only when genitives are postnominal ((1)c-d). Finally, it is important to note that adjectives and other modifiers in OE are prenominal, like in PDE. The two possible orders are then Gen-Adj-N ((3)a-b) and Adj-N-Gen ((3)c-d).

(3) a. *mid* ***þas*** ***folc-es*** *eorðlican* *ðeowote*
with the.GEN people-GEN terrestrial slavery
'with the terrestrial slavery of the people' CP:18.131.11.890

b. ***God-es*** *ancennedan* *suna*
God-GEN only-begotten son
'God's only-begotten son' ACHom_I,1:427.220

c. *on þa frecnan* *tid* ***þære*** ***ehtnyss-e***
in the dangerous time the.GEN persecution-GEN
'In the dangerous time of the persecution' Bede_1:8.42.3.345

d. *se wolberenda* *stenc* ***þære*** ***lyft-e***
the polluting stink the.GEN air-GEN
'The polluting stink of the air' Bede_1:11.48.16.433

2.2 Fronting, LPN, Dislocation and Split Genitives

We can find sentences in which a genitive violates one of the configurations that we presented in the previous section. In these cases, the presence and the position of determiners and adjectives can be used to determine whether a genitive NP has moved outside of its original position.

For instance, genitives can be fronted. This means that a genitive which originates in postnominal position might surface before the noun (Crisma 2012: 203). The presence of a determiner in front of the matrix noun and after a genitive NP is evidence that fronting has occurred (4), and that the sentence needs to be analyzed with the structure in (5).

(4) **þæs dæl-es** se dæl
the.GEN valley-GEN the part
'the part of the valley' Or_1:3.23.7.454

(5) $_{DP}$[**Gen2** $_{DP}$[D $_{AgrNP}$[AgrN $_{FP}$[~~**Gen2**~~ $_{F'}$[F $_{NP}$[N]]]]]]

In this case, we would not predict the presence of the article *se*, because as we saw in (1)a-b, when a prenominal genitive is present, the sentence can be interpreted as definite without a definite article.

Genitive NPs that do not express argumental relations with the noun can be another exception, which is more problematic. This is the case of vocatives, predicates or modificational relations, a counterpart of phrases like *a blue woman's hat* in PDE, where the adjective exceptionally precedes the possessor. Crisma (2012) describes them as Low Prenominal Genitives (LPN) and proposes to analyze them as compounds, but alternatively they can be considered modifiers (or 'modificational possessives', in Munn 1995). Like in PDE, we can distinguish them through the position of an adjective before a genitive that precedes the noun ((6)a-b).

(6) a. *fæger* ***God-es*** *engel*
beautiful God-GEN angel
'a beautiful angel of God' AELS_[Sebastian]:296,1389

b. *mid hate* ***gat-e*** *meolce*
with hot goat-GEN milk
'with hot goat milk' LchII_[3]:6.1.1.3605

This is an order that typically does not occur with prenominal genitives. Note that genitive NPs that appear before the noun are ambiguous between LPNs and prenominal genitives when N is not modified or preceded by an article: for instance, the noun phrase *Godes engel* in ((6)a) could be analyzed in either way had it appeared without the adjective. For this reason, Gen + N constructions are ambiguous.

Allen (2008: 89–95) reports cases of dislocation to the right of the sentence, mostly involving genitive NPs with partitive reading ((7)a-b). She finds forty cases of dislocation in *Ælfric Homilies* (4% of the total number of genitive NPs).

(7) a. *Twa cynn sind* ***martirdom-es***
two kinds are martyrdom-GEN
'There are two kinds of martyrdom' ACHom_II,42:314.132.7111

b. *Sum dæl eac* ***þæs*** ***sæd-es*** *befeoll*
some part also the.GEN seed-GEN fell
'A part of the seed also fell' ACHom_II,6:52.10.1069

These cases can be easily detected when they are outside of the NP. Moreover, there is also a diagnostic to check whether NP internal dislocation is possible. Relative clauses normally occur after postnominal genitives, a generalization

Order	Tokens
Gen N Rel	599
N Gen Rel	231
N Rel Gen	9

Table 1 The distribution of relative clauses in the nominal phrase

which is still true for all Germanic languages (see Longobardi, Guardiano, Silvestri, Boattini & Ceolin 2013, Appendix, P56, *Consistency Principle*). In order to identify dislocation, we would have to see a genitive NP following a relative clause (N-Rel-Gen).

A search we performed on the YCOE yielded the results in Table 1. As predicted, relative clauses follow the genitive NP in the large majority of the cases. In nine cases only there seems to be dislocation. The relevant examples are in ((8)).

(8) a. *ðam ðale þe þær ungefreod to lafe wæs* ***þære***
the portion that there unfreed to remains was the.GEN
cyningfeorm-e *[...]*
royal+purveyance-GEN
'The portion of the royal purveyance which was left unfreed'
codocu3,Ch_218_[HarmD_12]:1.2

b. *þone wisdom, ðe heo cuðe,* ***þare godcund-an***
the wisdom that he possessed the.GEN divine-GEN
cyðð-e
knowledge-GEN
'The wisdom of the divine knowledge that they possessed'
Bede_5:20.472.14.4747

c. *se goda cræft ðe he ðær licette* ***ðære***
the good virtue that he there has+simulated the.GEN
forgifness-e
forgiveness-GEN
'The good virtue of forgiveness that he has simulated'
cocuraC,CP_[Cotton]:33.220.24.62

The most common type is represented by the first example, where the genitive has a partitive reading ((8)a), like the sentences in ((7)). Additionally, as we can see from the other two examples ((8)b-c), non-partitive genitives can also

be fronted. In this context, we cannot tell if the genitive NP was originally prenominal or postnominal. However, the phenomenon appears to be rare.

Finally, another property of OE is that a phrase can contain two genitives, one before and one after the noun. We have some instances where the two genitives seem to be modifying the same matrix noun. Allen (2008: 95) does not provide counts, but the constructions must be rare, because we could not find more than one case (9).[4]

(9) **God-es** berne **heofon-an ric-es**
God-GEN barn heaven-GEN kingdom-GEN
'God's barn of the kingdom of heaven' AHom_,5:256.845

A corpus search on the YCOE yielded 13 additional cases, but none of them was a double genitive: in most of them, the two genitives are part of the same genitive phrase, with one of the two genitives outside of its original position. This is the phenomenon which has been described as 'split genitives', and is correlated with coordinations and appositions (Lightfoot 2006: 114, Allen 2008: 89–94). Here are some examples (in (10)a and (10)b).

(10) a. ***Inwær-es*** *broþur* *ond* ***Healfden-es***
Inwær-GEN brother and Healfden-GEN
'Inwær and Healfden's brother' ChronA_[Plummer]:878.6.881

b. ***Ælfred-es*** *godsune* ***cyning-es***
Alfred-GEN godson king-GEN
'King Alfred's godson' Anglo-Saxon Chronicle 890
(Laud(Peterborough))[E] 1122)

A detailed analysis, with counts, of these types of constructions is outside the scope of this work, because it would require a detailed investigation of the phrases in their context, but the very existence of phrases like (9) (which is speculative, given their rarity) will have some implications for the discussion, in the next sections, of the decline of postnominal genitives in late OE.

One question that we have not addressed in this section is whether the licensing position for genitive NPs was associated with specific semantic roles, and this is because previous investigations found that this was not the case. External and internal arguments could appear on either side of the noun, with no preference for either position (Allen 2008: 97–98). Therefore, the analysis in the following sections will largely omit semantic considerations, even though some reference to semantics will appear when appropriate.

4 An anonymous reviewer suggested that 'double genitive' sentences could be a case of blending. This would be the counterpart of sentences that have been described as syntactic amalgams (Lakoff 1974, Lambrecht 1988).

Document	Period	Pre	Post	Periphrastic
Cura Pastoralis	9th	258 (50.7)	250 (49.1)	1 (0.2)
Boethius	9th	330 (48.5)	348 (51.2)	1 (0.3)
Orosius	9th	238 (64.1)	127 (34.2)	6 (0.7)
Bede	9th	349 (49.9)	347 (49.6)	3 (0.5)
Old English Martyrology	10th	423 (69.9)	191 (31.1)	0 (0.0)
Blicking Homilies	10th	549 (66.1)	277 (33.3)	4 (0.6)
Rules of Benedict	10th	477 (70.9)	178 (26.4)	18 (2.7)
Gregory Dialogues	11th	239 (68.3)	104 (29.7)	7 (2.0)
Ælfric Homilies	11th	1991 (73.9)	686 (25.5)	16 (0.6)
Ælfric's Heptateuch	11th	603 (77.2)	137 (17.5)	16 (5.3)
West Saxon Gospels	11th	869 (87.3)	123 (12.4)	3 (0.3)
Ermahnung zu Christlichem Leben	11th	27 (79.4)	7 (20.6)	0 (0.0)
De Nativitate Sanctae Mariae	11th	85 (68.2)	39 (31.8)	0 (0.0)
Anglo-Saxon Chronicle D	11th	411 (76.8)	184 (23.2)	0 (0.0)
Legende von der Heiligen Veronica	11th	38 (80.9)	8 (17.0)	1 (2.1)
Evangelium Nicodemi	11th	80 (72.0)	30 (27.0)	2 (1.0)
The legend of St. Andrew	11th	24 (69.4)	14 (28.6)	(2.0)

Table 2 Prenominal and postnominal genitives in Old English, summary table from the numbers in Thomas (1931: 65–66).

3 The decline of postnominal genitives

3.1 The shift toward prenominal position

Thomas (1931) is the first work that addresses the question of the change in the position of genitive NPs from early to late OE texts through an extensive study of the manuscripts. Thomas tracks prenominal, postnominal and 'periphrastic genitives', namely constructions involving the preposition *of*, which in OE is not used to introduce nominal arguments; it is used as a locative preposition, that in some cases can have a partitive reading overlapping with the meaning of a postnominal genitive. We have summarized the calculations in Thomas (1931: 65–66) in Table 2.

As we can see, the number of periphrastic genitives is low, suggesting that these types of genitives were not available in OE. The numbers relative to prenominal and postnominal genitives are plotted in Figure 1, which has the estimated year of the text on the x-axis and the relative frequency of postnominal genitives on the y-axis. There seems to be, indeed, a regular trend in the decrease of postnominal genitives from the early texts to the late ones.

It is worth noting that one of the main challenges in studying the decline of postnominal genitives is the estimation of the dates of the texts. The esti-

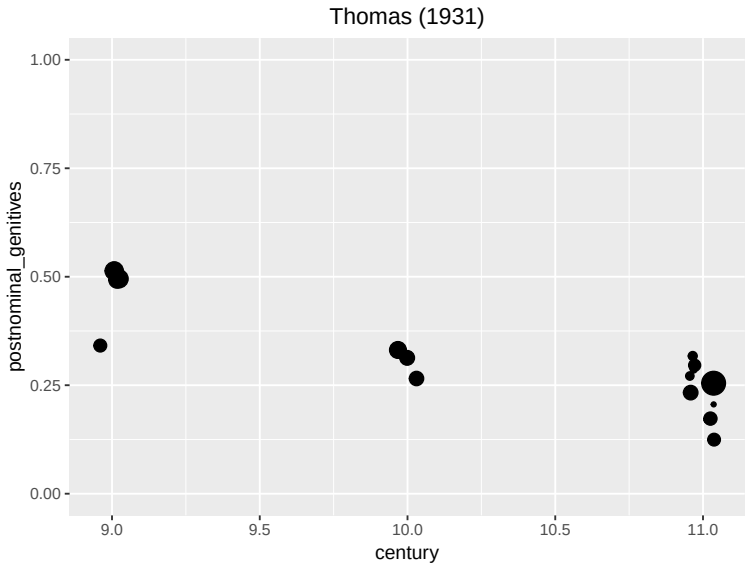


Figure 1 A scatter plot (with jitter) from the numbers reported in Thomas (1931: 65–66). The size of the dots represents the amount of tokens for each text.

mates in Thomas (1931) were mostly based on the dates of the manuscripts, unless there was independent evidence for associating them with an earlier period. Moreover, the analysis in Thomas is pre-theoretical, and therefore does not address the constructions that we pointed to in the previous section. These are both issues that will be addressed in more detail in the next sections.

The change in the frequencies of postnominal genitives was also noted in many other works (Timmer 1939, Yerkes 1982, Mitchell 1985, Crisma 2012), and a good summary of the main findings is provided in Allen (2008: 112–120). The first piece of evidence that Allen provides is that we have two versions of the same text, *Gregory's Dialogues*, one written at the time of King Alfred (9th century) and the other one revised in the second half of the 10th century, in which the distribution of genitive NPs is indeed different, according to Timmer (1939), Yerkes (1982) and Mitchell (1985).[5]

5 Since the text is a translation from Latin, one might wonder if this could have had an effect on the distribution. The genitive system in Latin was close to the OE one, with the difference that from the texts of the 3rd century, a pattern opposite to the OE one has been identified: prenominal genitives, in fact, decreased in frequency (Gianollo 2012). For this reason, the increase of prenominal genitives cannot be ascribed to Latin influence. Moreover, both Timmer

Document	Period	Pre	Post
Cura Pastoralis (CP)	Early West Saxon	181 (41.0)	256 (59.0)
Cura Pastoralis (curaC)	Early West Saxon	2 (13.0)	13 (87.0)
Orosius (Oros)	Early West Saxon	85 (74.0)	30 (26.0)
Anglo-Saxon Chronicle A (ASC(A1))	Early West Saxon	15 (54.0)	13 (46.0)
Rules of Benedict (BenR)	Late West Saxon	89 (79.0)	24 (21.0)
Ælfric Homilies (CH1)	Late West Saxon	389 (83.0)	77 (17.0)
Ælfric Homilies (CH2)	Late West Saxon	373 (83.0)	77 (17)
Wulfstan Homilies (Wulf)	Late West Saxon	18 (86.0)	3 (14.0)

Table 3 Prenominal and postnominal genitives in Old English, summary table from the numbers in Allen (2008).

Additionally, Allen provides the result of a corpus search on the frequencies of genitive NPs in the manuscripts of the YCOE which are closer in their date of composition to the originals, therefore avoiding the problem of estimating the dates of the texts. In order to control for effects like 'heaviness', fronting and alternation between proper nouns and common nouns, Allen limits her analysis to Det + N genitive NPs. The numbers she reports are in Table 3.[6]

Allen notices that, apparently, there is variation in the early texts, but the trend in Thomas (1931) is confirmed (see Figure 2).

3.2 Causes of the shift

The literature proposed at least three possible sources for the reduction of postnominal genitives:

1. **Loss of genitive case marking**. One of the proposals for the decline of postnominal genitive NPs is the loss of genitive case-marking. This was the position held by Lightfoot (1999), who argues that the case system of Early Middle English was not productive, and therefore at some point children lost evidence for case, and therefore could not license genitive NPs. Allen (2008: 122) refers to this hypothesis as the 'Early Reanalysis Hypothesis'. This hypothesis has not been supported in the most recent literature. Crisma (2012) provides some arguments for the inverse scenario, namely, the hypothesis that it was the change in frequency of postnominal genitives that triggered their reanalysis, the loss of genitive

(1939) and Yerkes (1982) show that the Latin grammar does not have a regular influence, neither in the old manuscript of the *Dialogues* nor in the revised one.

6 We corrected a mistake in the numbers for BenR, where a percentage of 23 was erroneously reported for postnominal genitives.

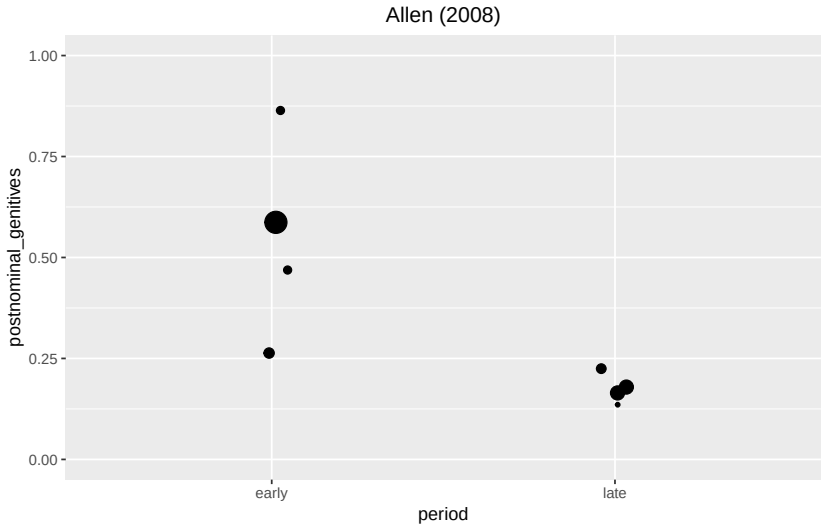


Figure 2 A scatter plot (with jitter) from the numbers reported in Allen (2008: 114). The size of the dots represents the amount of tokens for each text.

case marking and ultimately the spread of *of*-phrases. This hypothesis is in agreement with Allen's (2008: 121) observation that genitive inflection is retained for longer than dative and accusative marking, at least until the end of the 14th century.

2. **Grammar competition**. The grammar competition model proposed in Kroch (1989) makes a clear prediction about the change in relative frequencies in the case of competition between two different grammars in a population of speakers: when syntactic variation results from grammar competition, we can detect the change proceeding in different contexts at the same rate. The proposal is compatible with the fact that Scandinavian influence on late Old English and later stages is well documented, at all linguistic levels.[7] The first one to propose that the shift from postnominal to prenominal position 'might perhaps be ascribed to Scandinavian influence' was Jespersen (1912: 83). However, two caveats should be made at this point. First, it is not clear why Scandinavian influence would favor prenominal genitives: in fact, the earliest attestations of Old Norse display genitives in postnominal position, with the prenominal position reserved

7 I refer to Tony Kroch's website for a list of resources: https://www.ling.upenn.edu/~kroch/.

for emphatic readings (Nygaard 1905).[8] Therefore, if there is evidence for a competition, its source is more likely to be internal to OE dialects. And second, in the case of OE, it is not clear what the competitors are: is it the case that we have an initial grammar where genitives are licensed in postnominal position competing with an innovative grammar where genitive licensing is only prenominal, or is it the case that a grammar in which genitive case can be licensed in two different positions is competing with a grammar in which only prenominal genitives are available? On the one hand, we have almost no examples of phrases in which a noun expresses two nominal argument simultaneously (see the end of section 2.2), but on the other hand the asymmetry in the interaction between the two kinds of genitives and definiteness interpretations (see section 2.1) makes it unlikely that a grammar of the OE type, with prenominal genitives only, would be plausible: conveying the meaning of certain indefinite phrases would not be possible using prenominal genitive NPs (see the discussion in Crisma 2012: 211). We will come back to these problems in the next sections.

3. **Discourse processing**. Finally, Allen (2008: 119) mentions the possibility that the shift has been caused by the interaction of syncretism, which preceded the loss of case marking, and discourse processing considerations. We report her quote in full:

> *With the prenominal genitive, the hearer/reader got information early on which helped to identify the head N, "anchoring" the NomP in the phrase of Cognitive Grammar, but because the early material was in the genitive case, the grammatical relation of the entire possessive phrase was not made clear until the head N was reached, where the case of this N would make this clear. On the other hand, with the postnominal genitive, this information concerning grammatical relations could be given right away with the case marking of the modifiers of the noun (or of the noun itself), but the speaker or hearer had to wait a bit to get the information which narrowed the reference of the noun. It should be noted, however, that syncretism had rendered case marking less useful in sorting out grammatical relations by the OE stage than it would have been in CG* [Common Germanic] *or earlier. Grammatical relations in OE could to a significant extent be predicted on the basis of word order, which would to some extent nullify one advantage of the postnominal genitive. This could have been a factor in the decreasing frequency of use of the postnominal non-partitive genitive in the OE*

8 The two oldest texts in the Icelandic Parsed Historical Corpus (IcePaHC, Wallenberg, Ingason, Sigurðsson & Rögnvaldsson 2011), which were written in the 12th century, also seem to prefer postnominal (1141) to prenominal (361) genitives.

> *period: one of the advantages which the postnominal genitive offered was not as strong as it had been.*

Let us try to break down Allen's hypothesis. Since in OE determiners and non-genitive modifiers agree with the noun in case marking, any of these elements is sufficient to identify the case marking of the matrix NP, and therefore its function in the sentence. Crucially, this does not happen if one encounters a genitive NP as the first element of the whole noun phrase: the genitive NP, being marked for genitive case, does not provide any information about the case marking of the other elements of the matrix NP, and therefore does not allow us to identify the function of the matrix NP in the sentence. For this reason, we might think that from a processing viewpoint, if we have the choice to start the noun phrase with a genitive NP or a non-genitive NP (like a determiner or a modifier), the second choice has an advantage, because it reveals more information about the matrix NP. However, this advantage is lost when syncretism occurs: if case-marking loses its function as a cue for the role of the noun phrase in the sentence, because it becomes ambiguous between different functions, then determiners and modifiers lose their processing advantage, and one needs to wait for the noun to identify the function of the noun phrase (namely, to 'anchor' the noun phrase). On the other hand, Allen argues that a prenominal genitive is informative to narrow down the referential domain of the head noun, and therefore can be used to obtain information about the head noun early on. She suggests that this factor might have promoted the use of prenominal genitives over time. This is an interesting hypothesis that so far has been unexplored.

These three hypotheses can be tested against corpus data in the YCOE, and come with different predictions. For instance, hypotheses like the loss of genitive case marking or the grammar competition model predict that a change should be equally visible in environments which differ by the complexity of the noun phrase. Conversely, a discourse processing model integrates the complexity of the noun phrase as a factor in the change: in particular, for the model proposed by Allen, the presence of a modifier might correlate with postnominal genitives in early texts, for the reasons that we have made explicit at point 3., but does not need to correlate with postnominal genitives in the absence of a modifier, because processing advantages vary with the complexity of the noun phrase. Finally, we should also consider that the hypotheses need not be mutually exclusive.

So far, the literature that addressed the relation between the position of genitive NPs and factors like the noun phrase complexity focused on single manuscripts (Timmer 1939, Nunnally 1985, McLagan 2004) or on the whole YCOE corpus without distinguishing the years of the manuscripts (Sampson

2010). However, if we want to evaluate different explanations for the decline of postnominal genitives, we need to assess whether and how the behavior of genitive NPs change over time with respect to these factors. This is what we will do in the rest of the paper.

4 Identifying the sources of the change

4.1 Factors that predict the position

We ended the last section mentioning that in order to test the different hypotheses that might explain the shift toward prenominal position, one should isolate different types of noun phrases and see if the change is detectable in all of them, or only in a subset, and then see if this subset is informative in relation to the hypotheses under study. In order to narrow down the possible contexts, we can start from the factors that have been shown to affect the alternation between genitive NPs expressed with the *'s* clitic and those expressed with the *of*-preposition in PDE.

In virtually all the studies on PDE, 'animacy' results the best predictor (Dahl 1971, Jahr Sorheim 1980, Altenberg 1982, Kreyer 2003, Hinrichs & Szmrecsanyi 2007, Rosenbach 2008, Szmrecsanyi 2013, Jankowski 2013, Jankowski & Tagliamonte 2014, Grafmiller 2014, Szmrecsanyi, Grafmiller, Bresnan, Rosenbach, Tagliamonte & Todd 2017). The prediction is that a noun that refers to human beings in PDE is more likely to take the *'s* clitic when it is used as an argument, while an inanimate noun is more likely to be expressed with the *of*-preposition.

Another predictor which has been widely studied in the literature is 'weight' (Rosenbach 2005, O'Connor, Maling & Skarabela 2013, Röthlisberger & Schneider 2013, Rosenbach 2014). According to the 'Principle of End Weight' (Wasow 2002, Rosenbach 2005), long elements tend to come after short elements in the discourse. For this reason, short nouns tend to be expressed through the *'s* genitive, while long nouns occur postnominally with the *of* preposition. Rosenbach (2008, 2014) discusses the problem of operationalizing the notion of 'weight': in fact, weight can be defined in many different ways, like number of characters, number of words and number of structural projections, but the correlation among these measures makes it practically difficult to distinguish between them (Wasow & Arnold 2003, Grafmiller & Shih 2011).

Going back to OE, Allen argues that the predictions are very similar. She mentions some studies (Mitchell 1985, Koike 2004, McLagan 2004) reporting that possessive pronouns and proper nouns, which were the main strategies to express animate referents, are correlated with prenominal position: possessive pronouns rarely occur postnominally (only in vocative forms), and the same is true for proper nouns (McLagan 2004 gives a ratio of 97% of

proper nouns in prenominal position based on *Ælfric Homilies*). As for weight, Timmer (1939) shows that the presence of an adjective inside a genitive NP is correlated with more postnominal genitives. McLagan (2004) also shows that the presence of adjectives, both inside the genitive phrase and outside of it (modifying the matrix noun), yields more postnominal genitives. A more recent investigation, Sampson (2010), confirms these predictions. However, the recent works do not address the impact of these factors in diachrony, namely if these factors are stable over time or if they are correlated with the overall shift toward prenominal position.

Testing the effect of animacy in OE would require annotating the whole corpus, and as shown by Rosenbach (2008), the factor cannot be easily reduced to a binary animate/inanimate choice. For this reason, the only thing we can do is treat proper and common nouns separately, following the intuition that on average we might expect proper nouns to be more correlated with animate referents. As for weight, while we cannot count the number of characters using a corpus search, we can count the number of words, and therefore we can see if altering the number of elements in the phrase has any effect on the position of the genitive NP. Our baseline will be 'light NPs' (4.2), namely noun phrases where the genitive NP contains a single element and the matrix NP does not contain any element other than the noun and, optionally, a determiner (namely, Gen + N and (Det) + N + Gen combinations). Our second condition (4.3) will focus on noun phases where the matrix NP contains a modifier in addition to the genitive NP. Our third condition (4.4) will focus on noun phrases where the matrix NP does not contain any modifier, while the genitive NPs contains either a determiner or a modifier.

In order to study the diachronic dimension, we decided to rely on the chronology of the texts proposed in Zimmermann (2014), who estimates the dates of the texts based on an analysis of fourteen syntactic constructions that exhibit variation over time (see also Ecay & Pintzuk 2016 for a discussion of the method). This strategy is used to overcome the problem that by grouping the texts by the period of the manuscripts rather than the period of their composition, one runs the risk of putting together texts whose manuscripts are coeval, even though their original composition date was not. Since one of the many syntactic constructions used by Zimmermann is indeed the genitive-noun order, there is a risk of circularity. However, we find the proposals in Zimmermann (2014) more plausible than other alternatives, especially because they have been corroborated by a large literature review. We added to the sample all the texts which were analyzed in Allen (2008) and Crisma (2012), because both works contained manuscripts for which the date of composition was close to the date of the originals. The texts are in the Appendix.

4.2 Light NPs

The first context that we focus on is 'light' noun phrases. In principle, a noun phrase can contain just two elements, a genitive NP containing a single noun followed by the matrix noun (Gen + N).[9] On the other hand, if there is a postnominal genitive, the noun phrase might require a determiner ((Det) + N + Gen). We want the matrix NP not to be modified by any adjective, quantifier, numeral or relative clause, because we want to control for the weight of the whole phrase, and to have it containing at most two words (or three words, if the matrix NP contains a determiner). The contrast is the one in ((11)).

(11) a. ***God-es*** *lufu*
God-GEN love
'God's love' ACHom_II,21:181.44.3997

b. *þære fóreteohunge* ***God-es***
the predestination God-GEN
'The predestination of God' BoHead:39.48

Isolating genitive NPs which contain proper nouns is fairly simple. The main requirement that we must enforce is that determiners must be absent from the matrix noun phrase in cases of prenominal genitives, because with the order Gen + Det + N we can tell that the noun is not in its original position, and with Det + Gen + N we know it is a case of LPN. As said in section 2.2, in this case we are not immune to fronting and LPN, especially in the absence of adjectives and other elements that can be used as a diagnostic. With the same queries, we can check the behaviour of common nouns. After we retrieve the noun phrases, we remove all the texts for which fewer than ten noun phrases containing a genitive NP are retrieved.

The ratio of postnominal genitive per text is plotted in Figure 3. If the noun phrase contains a proper noun, like in Figure 3a, the genitive is almost always prenominal. The mean of postnominal genitives is 0.015 for the texts in the 9th century, the maximum being King Alfred's translation of Boethius at 0.06, and it goes down to virtually 0 for the texts in the 11th century. On the other hand, if it contains a common noun (Figure 3b), there is some variation: the mean ratio of postnominal genitives is 0.085 across the whole period, and it reaches 0.1 in the texts of the 11th century.

We decided to fit a mixed effect logistic regression model for the two cases, with the position of the genitive NP as a dependent variable (with '1' representing postnominal genitives, and '0' representing prenominal genitives) and using century as a fixed effect. A random intercept for text

9 Old English has both bare plurals and bare singulars, see Crisma (2012: 201).

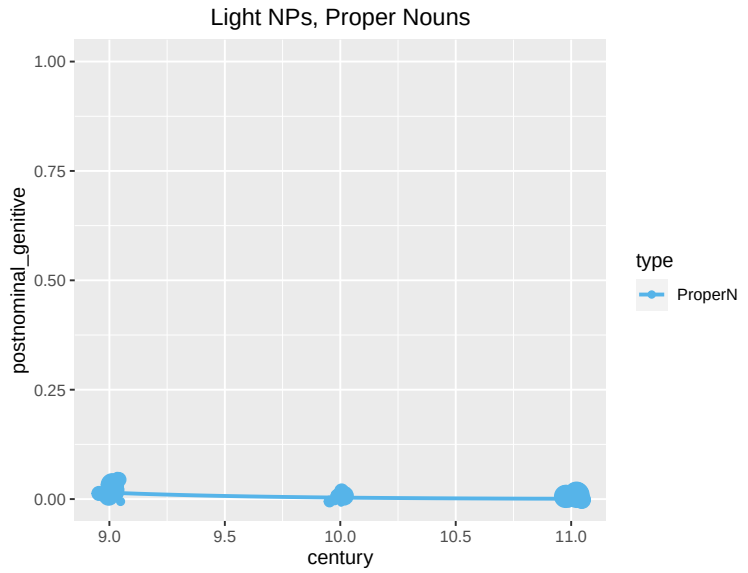
is the only random effect. We used the lme4 package in R (Bates, Mächler, Bolker & Walker 2014). Interestingly, century was significant for proper nouns (t=−3.255) but not for common nouns (t=0.376). Running an anova test using the anova() function in R and comparing the models against a random intercept-only model confirms the difference (anova p=0.002 for proper nouns, p=0.723 for common nouns). This confirms that the already rare postnominal genitive containing a proper noun, like (11)b, might have disappeared from the grammar at the end of the OE period.

Other works in the literature have noticed that when the noun phrases are short, genitives are almost always in prenominal position (Timmer 1939, Mitchell 1985, Nunnally 1985, McLagan 2004, Allen 2008), with the exception of partitive genitives, that instead occur postnominally. Moreover, since Timmer (1939) it has been noted that the effect was even stronger for proper nouns. The analysis shows that the effect is nearly categorical, and that there is a significant change over time: the few exceptions are concentrated in the texts from the 9th century, which suggests that a categorical reanalysis has occurred during the period.

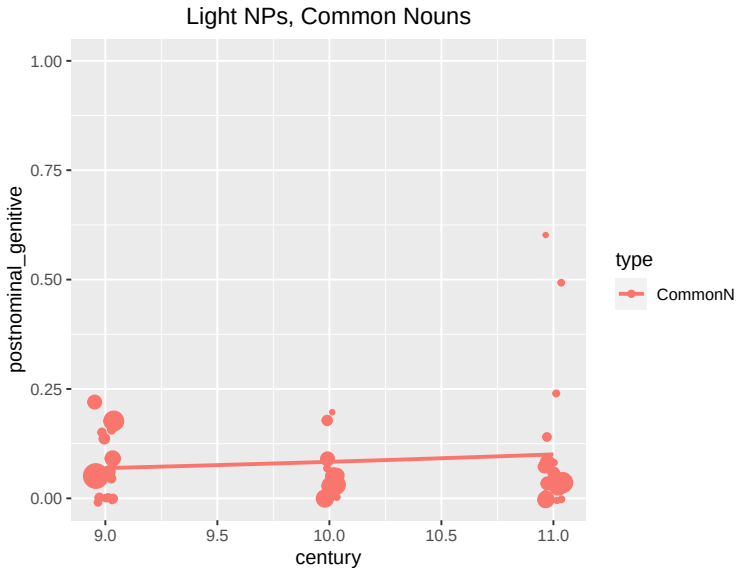
One might ask whether in all these cases the postnominal position was reserved for either non-possessive uses (e.g., internal arguments) or indefinite arguments, in addition to partitive uses. This would require a detailed semantic analysis, which is outside the scope of this article. However, investigating the data, we have found a good amount of variability, and in particular one example is clear enough to exclude that the postnominal possessive position was reserved for internal or indefinite arguments (12).

(12)
a.	αλιείς ανθρώπων	NTGreek, Matthew, 1:19, Mark, 1:17
b.	PISCATORES HOMINUM	*Vulgata*, Matthew 1:19, Mark, 1:17
c.	Nutans manne	Gothic, Mark, 1:17
d.	Manna fisceras	Mt_[WSCp]:4.19.193 and ACHom_I,_38:507.6.7541

In the biblical episode of the first meeting between Jesus, St. Peter and St. Andrew, described in the Gospel of Matthew and the Gospel of Mark, the texts contain the metaphor 'fishers of men'. The Greek text has the order N + Gen ((12)a), which is preserved in both the Latin *Vulgata* ((12)b) and the Gothic translation ((12)c). However, both the West Saxon Gospels and Ælfric's *Homilies* have the argument of the noun in prenominal position ((12)d), contrary to the original texts. We know that OE translators were used to changing the Latin word order when it was not the norm in their native language (Yerkes 1982). The translator of the Bible decided to switch the Latin order even though OE had a postnominal genitive as a structural possibility. Moreover, in this case the argument is both internal and indefinite. This suggests that for this kind of phrases, the unmarked position was the



(a) Proper Nouns. Tokens: 4658



(b) Common Nouns. Tokens: 3628

Figure 3 Postnominal genitives in Light Noun Phrases. The size of the (jittered) dots represents the amount of tokens for each text.

prenominal one.

Furthermore, the same result was found investigating the poetry texts available in the York Poetry Corpus (Pintzuk & Plug 2001). Surprisingly, the amount of postnominal genitives in 'light' noun phrases is comparable to that found in the prose texts (about 13%), even though we might have expected a higher freedom in word order. This number confirms that in 'light' noun phrases there was a strong tendency for the genitive to be prenominal.

These results cannot provide evidence for the hypotheses that loss of genitive case marking and grammar competition are the triggers of a shift toward prenominal position, because we do not see the expected change in the case of genitive NPs containing common nouns. In this case, the postnominal position was reserved for genitives with partitive use, according to Mitchell (1985), Nunnally (1985) and Allen (2008), and the situation is stable across the period. It is unclear, instead, why postnominal genitive NPs containing proper nouns disappeared from the language in this context. This will require analyzing the other contexts.

Interestingly, Allen's discourse processing account is perfectly compatible with this case. Her account predicts that prenominal genitives are under pressure when the noun phrase is long, because the presence of modifiers causes a delay in the identification of the head noun. In cases of short phrases, prenominal genitives might have been favored in prenominal position to narrow down the reference of the noun and 'anchor' the noun phrase.

4.3 Modified Matrix NPs

The second context that we investigate is 'modified' matrix noun phrases. In this case, we searched for NPs containing both a genitive NP and a modifier (adjective, numeral or quantifier). Like in the previous case, we must avoid the presence of a determiner inside the matrix noun phrase when dealing with prenominal genitives, to avoid fronting and LPNs. Ideally, we should control for the length of the genitive NP, like in the previous case, by focusing on one-word genitive NPs. For instance, in cases of genitive NPs containing a proper noun, the contrast is the one in (13).

(13) a. ***God-es*** *ancennedan* *suna*
God-GEN only-begotten son
'God's only-begotten son' AHom_1:52.35

b. *þære wynsuman suetness* ***God-es***
the winsome sweetness God-GEN
'The winsome sweetness of God' CP:14.83.3.539

The combination of noun phrases in which the noun is modified and the genitive NP contains a single word is uncommon, especially in the case of a

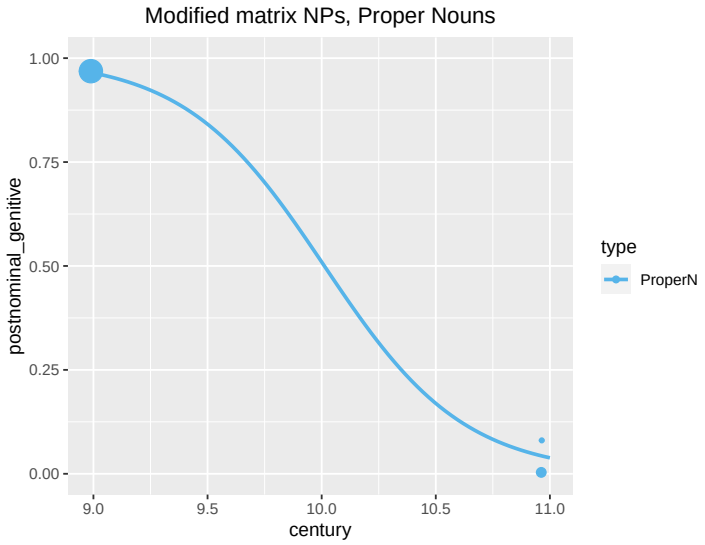
genitive NP containing only a proper noun: after filtering out all the texts for which we have fewer than ten tokens after the search, we found 55 NPs only (in Figure 4a), distributed in three texts: Bede's *History of the English Church*, Ælfric's *Heptateuch*, and Wulfstan's *Homilies*. In cases of genitive phrases containing only a common noun, we obtained 225 NPs, displayed in Figure 4b (in red). We decided to extend the comparison to a third case: genitive NPs of the type Det + N (Figure 4b, in green). With all the filters, and after discarding all the texts with less than ten noun phrases compatible with the queries, we obtained 526 NPs.

The results in Figure 4 are different from what we have seen in the preceding section. In the early texts, the presence of a modifier in the matrix noun has a strong effect as a predictor of the postnominal position in all conditions, whether the genitive is a proper noun (0.964 in Bede), a common noun (mean=0.821), or a Det + N combination (mean=0.897). We note that the most salient exception among the texts of the 9th century is Bald's *Leechbook*, with a ratio of postnominal genitive NPs of 0.375. While in the case of proper nouns this constraint disappears in the late texts (we find only one postnominal genitive, in the *Heptateuch*), in the other two cases the constraint appears stable over time: the postnominal position is the preferred one also in the texts of the 11th century (mean=0.839 for common nouns only, 0.879 for Det + N genitive NPs).

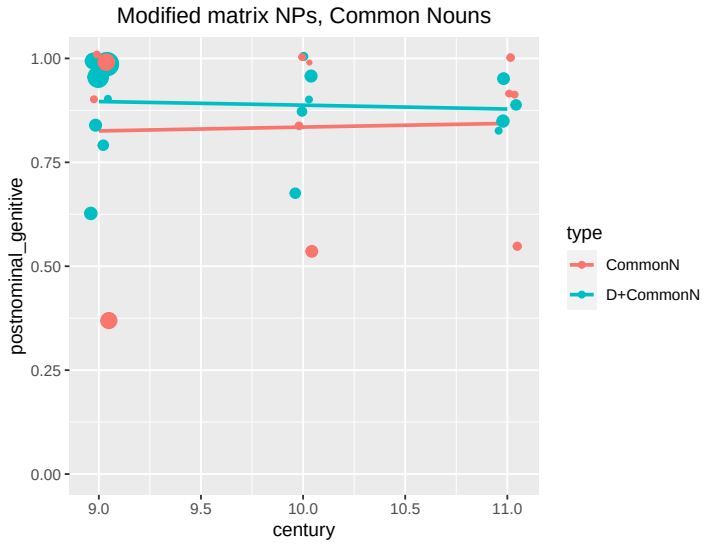
Like in the previous case, a mixed effect logistic regression model yields a significant effect for the coefficient for century in the case of proper nouns (t=-16.82) and two non-significant effects in the case of common nouns (t=0.153) and Det + N combinations (t=$-$0.272). The results are confirmed by an anova analysis (respectively, anova $p<0.001$, p=0.861, and p=0.771). While in the case of proper nouns there is a trend toward prenominal position, we cannot argue for a change in the other two cases, because there is a general preference for genitives to be postnominal across all periods.

This is in contrast with the principle of End-Weight that applies to PDE (Wasow 2002, Rosenbach 2014), for which it is the shorter constituent that ends up in prenominal position, in this case the genitive phrase. If the genitive NP is short and the matrix NP is long, then we would expect the order Gen + Adj + N. For instance, sentences like 'John's most recent book' (from Rosenbach 2005) would be more likely to be written as 'the most recent book John-GEN' in OE.[10] The interaction between postnominal genitives and the presence of other modifiers in the phrase was previously noticed in Timmer (1939), Mitchell (1985), McLagan (2004), Sampson (2010), and Crisma (2012), but here we show that this factor appears, at least in

10 An anonymous reviewer pointed out that there is an interesting discussion in Wolk, Bresnan, Rosenbach & Szmrecsanyi (2013) about how End-Weight is problematic when it comes to PDE. The argument in Wolk et al. is that End-Weight is not linearly correlated with genitive choice, and therefore its effect can only be detected in very long phrases.



(a) Proper Nouns. Tokens: 55



(b) Common Nouns. Tokens: 751

Figure 4 Postnominal genitives in Modified Matrix Noun Phrases. The size of the (jittered) dots represents the amount of tokens for each text.

noun phrases containing common nouns, independent from the general shift toward prenominal position.

Since the number of noun phrases in this case is not great, any generalization should be careful. However, we note that this pattern is potentially problematic for all the explanations for the shift toward prenominal position. First, it is not clear how the presence of modifiers should matter in cases of genitive loss or grammar competition, and in particular this context is showing that the postnominal position was structurally available across the whole period, something that we would not expect in the case of a structural reanalysis. Second, the discourse processing hypothesis, as stated in Allen (2008), would make the opposite prediction in cases like this one: in fact, if late OE texts are characterized by syncretism, and therefore case ambiguity, a genitive should be favored in prenominal position, because it restricts the referential domain of the noun.

Since these observations are not compatible with the long quote from Allen (2008) in section 3.4, we need an amendment to maintain the hypothesis. From a discourse processing perspective, it might be that long phrases favor an early positioning of the head, because waiting too long to hear the head of a constituent might be associated with processing cost. Gildea & Temperley (2010) explain similar patterns in natural languages in terms of dependency length minimization, by arguing that if a head is in a dependency relation with two constituents and the language has the option to place the constituents on either side, the split order is preferred to having the constituents on the same side, because the latter would result in an overall higher distance in terms of dependency length. In this particular case, the fact that the order Adj + N + Gen is preferred to the order Gen + Adj + N, which would indeed cause a noun and one of its dependent to not be adjacent, seems to be independent from diachronic change, but is stable over time, at least in the case of common nouns.

The result on proper nouns confirms the suggestion that postnominal genitive NPs containing proper nouns were so rare that a reduction of postnominal genitives in other contexts prompted a reanalysis of them as categorically prenominal. Note that this cannot be easily accounted for appealing to grammar competition, because it would be odd that the competition involved noun phrases with proper nouns, but not noun phrases with common nouns.

In the next section, we focus on whether the weight of the genitive phrase is also a predictor of its position throughout the whole period.

4.4 Heavy Genitive NPs

The third context that we focus on is 'heavy' genitive noun phrases, namely genitive NPs that contain a modifier. An additional contrast that we want

to check is whether in the absence of modifiers in the matrix noun phrase, having a 'simple' genitive NP of the type Det + N (like in the second condition of Figure 4b) would yield results different from those that we have seen in 4.2, where the genitive was a single noun with no determiners (namely, a proper noun or a bare noun), to see if the presence of the determiner has any impact on the weight of the genitive NP (which in this case has two words instead of one).

The matrix noun, instead, is not modified by any adjective, in all conditions. The queries are also formulated in order to exclude appositions and relative clauses inside the genitive NP. Like in the previous cases, every text that did not yield at least ten noun phrases containing a genitive NP was discarded.

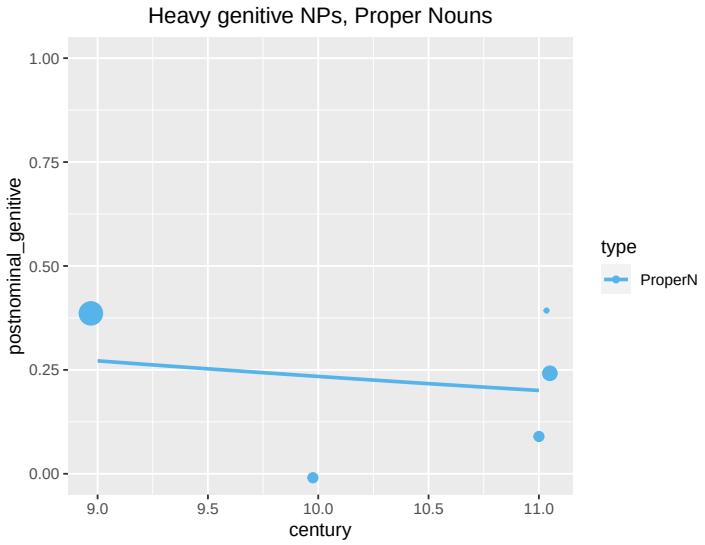
Modified proper nouns in genitive case are not very common (only 81 NPs), while both Adj + N genitive NPs and Det + N genitive NPs are common. As an example, the relevant contrasts for Det + N genitive NPs is (14).

(14) a. ***þæra*** ***cyning-a*** *gewinne*
the.GEN.PL king-GEN.PL conquest
'the kings' conquest' ALS_[Maccabees]:1.4837

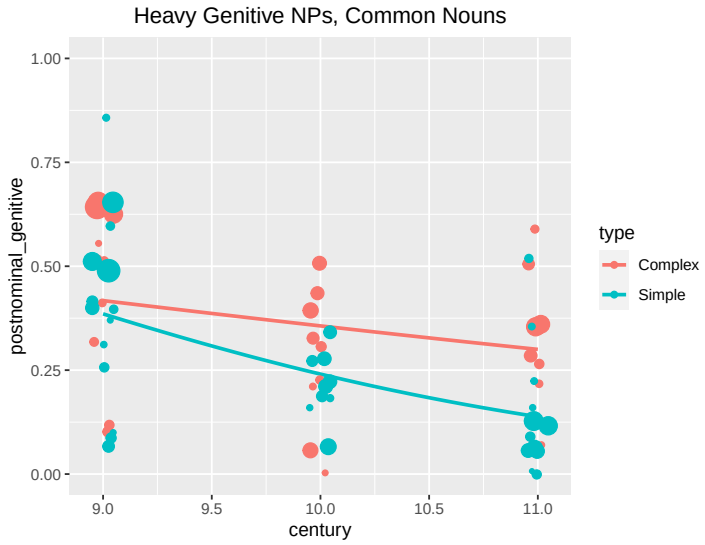
b. *þam deorlingum* ***þara*** ***cyning-a***
the favorite the.GEN.PL king-GEN.PL
'the kings' favorites' Bo:29.67.14.1251

These graphs are much harder to interpret, because there is extreme variability across all periods. In all conditions, there is alternation in the 9th century. The only text that has modified proper nouns in genitive case in this period is *Gregory's Dialogues* (before the revision), and 13 out of 36 noun phrases display a postnominal genitive NP (0.389). Interestingly, the revised version of the 10th century has all the genitive NPs containing an adjective and a proper noun in prenominal position, while we see some variability in Ælfric's texts at the end of the period. As for common nouns, we have similar numbers for the 9th century (mean=0.451 for the Adj + N 'complex' case, and 0.393 for the Det + N 'simple' case) and then a reduction in the 11th century texts (mean=0.337 and 0.147, respectively).

For proper nouns, contrary to the previous graphs, no significant diachronic trend is detectable through a mixed effect logistic regression model ($t=-0.383$, anova $p=0.493$), and this might suggest something different for this context, for example the lack of a categorical reanalysis. We have a significant effect for 'simple' NPs ($t=-3.938$, anova $p<0.001$), but not for 'complex' NPs, even though the effect is almost significant ($t=-1.549$, anova $p=0.117$). Since this clearly looks like a potential case of grammar competition, we



(a) Proper Nouns. Tokens: 81



(b) Common Nouns. Tokens: 5608

Figure 5 Postnominal genitives in Heavy Genitive Noun Phrases. The size of the (jittered) dots represents the amount of tokens for each text.

tried to fit a model to predict postnominal genitives given the interaction between century and year, to see if the difference between the two slopes in these last two conditions is significant, and the model says that they are: the interaction term century*year is significant ($t=-5.079$, anova $p<0.001$). This means that we do not have evidence for a Constant Rate Effect, because the slope is not the same, but given the uncertainty in the dates we cannot exclude the hypothesis.

These results are partially compatible with the observation in Timmer (1939), McLagan (2004) and Sampson (2010) that the presence of an adjective internal to the genitive NP can yield postnominal genitives, as one would expect given End-Weight. However, this pattern is clearly different from that found in the previous context, where modifiers of the matrix noun were present: in the case examined in the previous section, the pattern was stable in diachrony and consistent, while in this case it appears variable and, in all cases, not diachronically stable. The case of proper nouns is interesting: while in the previous context in late texts proper nouns are categorically prenominal, here we still see some of them in postnominal position, which suggests that there was a End-Weight effect which was weakened over time, but still active.

Interestingly, having or not having a determiner in the genitive NP makes a difference, because we have seen that not having a determiner in the genitive NP, but a single noun, causes the genitive NP to be in prenominal position (see 4.2).

Both the loss of genitive marking and grammar competition are explanations compatible with this scenario. However, if these were the true explanations, we would expect to see an effect also when a modifier is present in the sentence, and this is something that we did not see in the last section. The discourse processing account by Allen (2008) also fails to account for this pattern: if we have a noun phrase of the type (N + (Det + Gen)) or (N + (Adj + Gen)), why would syncretism favor the placement of the genitive NP before the noun? In both cases, an initial determiner or an initial adjective inflected for genitive case would not have an effect in narrowing down the reference domain of the matrix noun, at least not as much as having a noun with genitive case in word initial position, something we did not see happening given the behavior of 'modified matrix NPs'. It is not clear to us how having the genitive NP prenominally would be advantageous from a discourse processing viewpoint, in this specific context.

In conclusion, the only real context that shows some change in diachrony is this last one: when the genitive phrase is 'heavy' (i.e. it contains at least two elements) and the matrix noun is unmodified, while in early texts there was some freedom in placing it before or after the noun, in late texts there is a tendency of placing it prenominally, like with 'light' genitive NPs. Since

none of the hypotheses clearly predict this pattern, and the main difference between 'heavy' and 'light' genitives is the weight of the genitive NPs, one possibility is that the option of having postnominal genitives in the absence of modifiers of the matrix noun depended on a 'weight' factor that simply became weaker over time, for reasons which are not clear. In particular, the fact that 'heavy' genitives were often moved after the noun in early texts is similar to what happens in PDE (Rosenbach 2005), and therefore the fact that this option disappeared from the language is surprising.

5 Conclusion

In this paper, we showed that:

1. Genitive NPs are generally limited to prenominal position when the noun phrase is 'light'. This was already noticed in Timmer (1939), Mitchell (1985), and Nunnally (1985). This effect is stable in diachrony for common nouns, but not for proper nouns, which might have become categorically prenominally at the end of the OE period. The effect is similar to the End-Weight factor that determines the position of genitives in PDE. This is also compatible with discourse processing accounts, because in the case of short noun phrases there is no cost associated with having the genitive in prenominal position; in fact, having the genitive first might be useful to narrow down the referential domain of the noun. However, it is less clear how loss of genitive case marking and grammar competition relate to this case, because there is no clear diachronic effect for common nouns.

2. If the matrix noun is modified, genitive NPs tend to appear in postnominal position. This had been noticed in Timmer (1939), Mitchell (1985), McLagan (2004), and Crisma (2012). This effect is also stable in diachrony, with the exception of genitive NPs containing proper nouns, where there seems to be a categorical reanalysis. This constraint is somehow in contradiction with the End-Weight factor that explains PDE genitive variation, because the presence of modifiers in matrix noun phrases triggers prenominal genitives in PDE rather than postnominal ones. This observation weakens the loss of genitive case marking and the grammar competition hypotheses, because it is not clear how the presence of a modifier would interact with morphological and grammatical processes. The observation is also not compatible with Allen's discourse processing account, because her account would predict that genitive NPs should be favored with respect to modifiers as phrase-initial elements in the absence of unambiguous case marking. However, this distribution can be explained with reference to other processing accounts, like the one in Gildea & Temperley (2010), which predicts that languages minimize dependency length when the

option is available in the grammar.

3. If the genitive phrase contains more than one element, early texts allow genitive NPs in either prenominal or postnominal position, while late texts show that they tend to be in prenominal position when the condition in (2.) is not met. This is the only case in which we do see variation and change over time. The loss of genitive case hypothesis does not explain why 'heavy' genitives are the only ones that underwent the change. As for the grammar competition hypothesis, even though we did not see a Constant Rate Effect in this context, we cannot exclude a grammar competition scenario, especially given the interesting fact that proper nouns behave like common nouns in this context. However, given that the two structural possibilities were active across the whole period in different contexts, this competition might have been limited to language usage. Finally, a discourse processing account is useful to explain the contrasts between 'light NPs' and 'modified matrix NPs', but is not compatible with this last pattern.

Now that we argued that the shift toward prenominal position was limited to contexts where the genitive NP was 'heavy', we are left with the question of why this change happened to begin with.

One possibility is that the weight of the genitive NP was the factor that allowed them to be optionally postnominal at the beginning of the period, following the End-Weight principle, and then this factor lost influence over time in favor of other factors. An interesting observation advanced in Timmer (1939: 66) is that the reduction of postnominal genitives with nouns associated to human referents preceded the reduction of postnominal genitives with nouns associated with non-human referents ('names of things'). This suggests an interesting hypothesis: namely, that the shift is the result of an increased sensitivity to animacy in the language, that affected different animacy categories incrementally (proper nouns, common nouns with human referents, and then the others) until all genitive NPs ended up in prenominal positions, with the exception of those that were co-occurring with other modifiers in the matrix NP and partitive genitives. Since proper nouns are usually associated with animacy and low weight, children might have reanalysed a weight constraint as an animacy constraint, then reducing the difference between 'light' and 'heavy' genitive NPs over time.

This is an interesting hypothesis, because there is independent evidence that factors like animacy and weight can change over time without affecting the syntactic structures or the morphology of the language (see Wolk et al. 2013). As an example, we used Google Ngrams to check the frequency of the noun phrase 'The speech of the president' versus 'The president's speech' from 1960 to 2000 and we obtained a graph (Figure 6) which could overlap

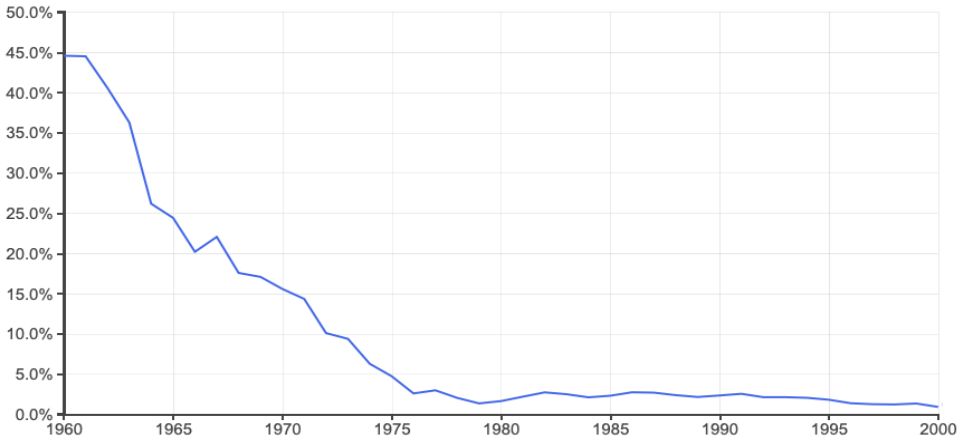


Figure 6 Google Ngrams for "the president's speech" versus "the speech of the president"

perfectly with the graphs in Figure 5b.[11]

This pattern leads us to conclude that when facing cases of historical changes where S-curves are detectable, we should be careful in investigating the possibility that the shifts are due to factors which are not structural. The case of OE genitives looks like a prototypical case in which clear evidence for a syntactic change is lacking, while a great amount of the variation can be taken into account by reference to animacy, weight and discourse processing.

Even though the identification of the trigger of the change will ultimately require a more detailed investigation of the constructions which turned out to be unstable in diachrony, this work shows once again how valuable annotated corpora are in studying variation and change over time. While previous investigations independently noticed all of the patterns that we described, few of them were able to clarify whether the patterns under study were stable in diachrony or not. We hope that this work was successful in doing so, and that it provided more material and suggestions to further stimulate the debate around this century-long puzzle.

11 The example is taken from Szmrecsanyi (2013).

References

Allen, Cynthia. 2008. *Genitives in Early English: Typology and evidence*. Oxford: Oxford University Press.

Altenberg, Bengt. 1982. *The genitive v. the of-construction: A study of syntactic variation in 17th century English*. Lund: Gleerup.

Bates, Douglas, Martin Mächler, Ben Bolker & Steve Walker. 2014. Fitting linear mixed-effects models using lme4. ArXiv preprint arXiv:1406.5823.

Biber, Douglas. 2003. Compressed noun-phrase structures in newspaper discourse. In Jean Aitchison & Diana M. Lewis (eds.), *New media language*, 169–181. London: Routledge.

Crisma, Paola. 2012. Triggering syntactic change: Inertia and local causes in the history of English genitives. In Dianne Jonas, John Whitman & Andrew Garrett (eds.), *Grammatical change: Origins, nature, outcomes*, 198–216. Oxford: Oxford University Press.

Crisma, Paola & Chiara Gianollo. 2006. Where did Romance N-raising come from? A parallel study of parameter resetting in Latin and English. In Jenny Doetjes & Paz González (eds.), *Romance languages and linguistic theory 2004*, 71–93. Amsterdam: John Benjamins.

Dahl, Liisa. 1971. The s-genitive with non-personal nouns in modern English journalistic style. *Neuphilologische Mitteilungen* 72(1). 140–172.

Ecay, Aaron & Susan Pintzuk. 2016. The syntax of Old English poetry and the dating of Beowulf. In Leonard Neidorf, Rafael J. Pascual & Tom Shippey (eds.), *Old English philology: Studies in honour of R. D. Fulk*, 144–171. Cambridge: Boydell and Brewer.

Gianollo, Chiara. 2012. Prepositional genitives in Romance and the issue of parallel development. In Charlotte Galves, Sonia Cyrino, Ruth Lopes, Juanito Avelar & Filomena Sandalo (eds.), *Parameter theory and linguistic change*, 281–320. Oxford: Oxford University Press.

Gildea, Daniel & David Temperley. 2010. Do grammars minimize dependency length? *Cognitive Science* 34(2). 286–310.

Grafmiller, Jason. 2014. Variation in English genitives across modality and genres. *English Language & Linguistics* 18(3). 471–496.

Grafmiller, Jason & Stephanie Shih. 2011. New approaches to End Weight. Presented at Variation and Typology: New Trends in Syntactic Research.

Guardiano, Cristina. 2003. *Structure and history of the Ancient Greek DP: parametric hypotheses*: Università di Pisa, doctoral dissertation.

Hinrichs, L. & B. Szmrecsanyi. 2007. Recent changes in the function and frequency of Standard English genitive constructions: a multivariate analysis of tagged corpora. *English Language and Linguistics* 11(3). 437–474.

Jahr Sorheim, Mette-Catherine. 1980. *The s-genitive in present-day English*: University of Oslo, doctoral dissertation.

Jankowski, Bridget L. 2013. *A Variationist Approach to Cross-register Language Variation and Change*: Universty of Toronto, doctoral dissertation.

Jankowski, Bridget L. & Sali A. Tagliamonte. 2014. On the genitive's trail: data and method from a sociolinguistic perspective. *English Language & Linguistics* 18(2). 305–329.

Jespersen, Otto. 1912. *Growth and Structure of the English Language*. 2nd ed. Leipzig: Teubner.

Koike, Takeshi. 2004. *Analysis of the genitive case in Old English within a cognitive grammar framework, based on the data from Ælfric's Catholic Homilies First Series*: The University of Edinburgh, doctoral dissertation.

Kreyer, Rolf. 2003. Genitive and of-construction in modern written English. Processability and human involvement. *International Journal of Corpus Linguistics* 8(2). 169–207.

Kroch, Anthony. 1989. Reflexes of grammar in patterns of language change. *Language Variation and Change* 1(3). 199–244.

Lakoff, George. 1974. Syntactic amalgams. *Chicago Linguistics Society 10* 321–344.

Lambrecht, Knud. 1988. There was a farmer had a dog: Syntactic amalgams revisited. *Proceedings of the Fourteenth Annual Meeting of the Berkeley Linguistics Society* 319–339.

Lightfoot, David. 1999. *The development of language: Acquisition, Change, and Evolution*. Oxford: Blackwell.

Lightfoot, David. 2006. *How new languages emerge*. Cambridge: Cambridge University Press.

Lindauer, Thomas. 1998. Attributive genitive constructions in German. In Artemis Alexiadou & Chris Wilder (eds.), *Possessors, predicates and movement in the determiner phrase*, 109–140. Amsterdam: John Benjamins.

Longobardi, Giuseppe. 2001. The structure of DPs: Some principles, parameters, and problems. In Mark Baltin & Chris Collins (eds.), *The Handbook of Contemporary Syntactic Theory*, 562–603. Oxford: Blackwell.

Longobardi, Giuseppe, Cristina Guardiano, Giuseppina Silvestri, Alessio Boattini & Andrea Ceolin. 2013. Toward a syntactic phylogeny of modern Indo-European languages. *Journal of Historical Linguistics* 3(1). 122–152.

McLagan, Helen R. 2004. *The Syntax of Genitive Constructions in Old English: Placement of Genitive Phrases in Ælfric's Second Series of Catholic Homilies*: Australian National University, doctoral dissertation.

Mitchell, Bruce. 1985. *Old English Syntax: Concord, the parts of speech, and the sentence*. Oxford: Oxford University Press.

Munn, Alan. 1995. The Possessor that Stayed Close to Home. In Vida Samiian (ed.), *Proceedings of the Western Conference on Linguistics (WECOL 24)*, 181–195.

Nunnally, Thomas Erie. 1985. *The syntax of the genitive in Old, Middle, and*

Early Modern English: University of Georgia, doctoral dissertation.
Nygaard, Marius. 1905. *Old Norse syntax*. Oslo: Aschehoug.
O'Connor, Catherine, Joan Maling & Barbora Skarabela. 2013. Nominal categories and the expression of possession. A cross-linguistic study of probabilistic tendencies and categorical constraints. In Kersti Börjars, David Denison & Alan Scott (eds.), *Morphosyntactic Categories and the Expression of Possession*, 89–121. Amsterdam: John Benjamins.
Partee, Barbara H & Vladimir Borschev. 2003. Genitives, relational nouns, and argument-modifier ambiguity. In Ewald Lang, Claudia Maienborn & Cathrine Fabricius-Hansen (eds.), *Modifying Adjuncts*, 67–112. Berlin: De Gruyter.
Pintzuk, Susan & Leendert Plug. 2001. *The York-Helsinki Parsed Corpus of Old English Poetry*. Oxford Text Archive.
Ritter, Elizabeth. 1991. Two functional categories in noun phrases: Evidence from Modern Hebrew. In Susan Rothstein (ed.), *Perspectives on Phrase Structure: Heads and Licensing*, 37–60. Leiden: Brill.
Rosenbach, Anette. 2005. Animacy versus weight as determinants of grammatical variation in English. *Language* 81(3). 613–644.
Rosenbach, Anette. 2008. Animacy and grammatical variation—Findings from English genitive variation. *Lingua* 118(2). 151–171.
Rosenbach, Anette. 2014. English genitive variation–the state of the art. *English Language & Linguistics* 18(2). 215–262.
Röthlisberger, Melanie & Gerold Schneider. 2013. *Of*-genitive versus *s*-genitive. A corpus based analysis of possessive constructions in 20th-century English. In Paul Bennett, Martin Durrell, Silke Scheible & Richard J. Whitt (eds.), *New methods in historical corpora*, 163–180. Tübingen: Narr-Verlag.
Sampson, Salena Ann. 2010. *Noun phrase word order variation in Old English verse and prose*: The Ohio State University, doctoral dissertation.
Schoorlemmer, Maaike. 1998. Possessors, Articles and Definiteness. In Artemis Alexiadou & Chris Wilder (eds.), *Possessors, predicates and movement in the determiner phrase*, 55–86. Amsterdam: John Benjamins.
Stefanowitsch, Anatol. 2003. Constructional semantics as a limit to grammatical alternation: The two genitives of English. In Günter Rohdenburg & Britta Mondorf (eds.), *Determinants of Grammatical Variation in English*, 413–444. Berlin: De Gruyter.
Szmrecsanyi, Benedikt. 2013. The great regression. Genitive variability in Late Modern English texts. In Kersti Börjars, David Denison & Alan Scott (eds.), *Morphosyntactic categories and the expression of possession*, 59–88. Amsterdam: John Benjamins.
Szmrecsanyi, Benedikt, Jason Grafmiller, Joan Bresnan, Anette Rosenbach, Sali Tagliamonte & Simon Todd. 2017. Spoken syntax in a comparative

perspective: The dative and genitive alternation in varieties of English. *Glossa. A Journal of General Linguistics* 2(1). 86.

Tagliamonte, Sali A & Alexandra D'Arcy. 2009. Peaks beyond phonology: Adolescence, incrementation, and language change. *Language* 85(1). 58–108.

Taylor, Ann, Anthony Warner, Susan Pintzuk & Frank Beths. 2003. *The York-Toronto-Helsinki Corpus of Old English Prose (YCOE)*. Oxford Text Archive.

Thomas, Russell. 1931. *Syntactical processes involved in the development of the adnominal periphrastic genitive in the English language*: University of Michigan, doctoral dissertation.

Timmer, Benno J. 1939. The place of the attributive noun-genitive in Anglo-Saxon. *English Studies* 21(1-6). 49–72.

Wallenberg, Joel C., Anton Karl Ingason, Einar Freyr Sigurðsson & Eiríkur Rögnvaldsson. 2011. Icelandic Parsed Historical Corpus (IcePaHC). Version 0.9. http://linguist.is/icelandic_treebank.

Wasow, Thomas. 2002. *Postverbal behavior*. Chicago: Center for the Study of Language and Information Publication.

Wasow, Thomas & Jennifer Arnold. 2003. Post-verbal constituent ordering in English. In Günter Rohdenburg & Britta Mondorf (eds.), *Determinants of Grammatical Variation in English*, 119–454. Berlin: De Gruyter.

Wolk, Christoph, Joan Bresnan, Anette Rosenbach & Benedikt Szmrecsanyi. 2013. Dative and genitive variability in Late Modern English: Exploring cross-constructional variation and change. *Diachronica* 30(3). 382–419.

Yerkes, David. 1982. *Syntax and style in Old English: a comparison of the two versions of Waerferth's translation of Gregory's Dialogues*. Binghamton, NY: Center for Medieval & Early Renaissance Studies.

Zimmermann, Richard. 2014. Dating hitherto undated Old English texts based on text-internal criteria. Ms., University of Geneva.

Appendix: the texts from the YCOE used in this work

9th: coalex.o23.psd, cobede.o2.psd, coboeth.o2.psd, cochad.o24.psd, cochristoph.psd, cochronA.o23.psd, cocura.o2.psd, cocuraC.psd, cogregdC.o24.psd, cogregdH.o23.psd, colaece.o2.psd, colaw1cn.o3.psd, colaw6atr.o3.psd, colawaf.o2.psd, colawafint.o2.psd, comargaC.o34.psd, comargaT.psd, comart1.psd, comart2.psd, comart3.o23.psd, comarvel.o23.psd, comary.psd, coneot.psd, conicodA.psd, conicodC.psd, conicodD.psd, conicodE.psd, coorosiu.o2.psd, coprefcath1.o3.psd, coprefcura.o2.psd, coprefsolilo.psd, coquadru.o23.psd, cosolilo.psd

10th: cobenrul.o3.psd, coblick.o23.psd, cochdrul.psd, codicts.o34.psd, codocu2.o2.psd, coeuphr.psd, cogregdH.o23.psd, coherbar.psd, coinspolD.o34.psd, comargaC.o34.psd, comarvel.o23.psd, coneot.psd, corood.psd, cosevensl.psd, coverhom.psd, coverhomE.psd, coverhomL.psd, covinsal.psd, cowsgosp.o3.psd

11th: coaelhom.o3.psd, coaelive.o3.psd, coalcuin.psd, coapollo.o3.psd, cobyrhtf.o3.psd, cocanedgD.psd, cocanedgX.psd, cocathom1.o3.psd, cocathom2.o3.psd, codicts.o34.psd, codocu3.o23.psd, codocu3.o3.psd, codocu4.o24.psd, coeluc1.psd, coeluc2.psd, coepigen.o3.psd, coeust.psd, coexodusP.psd, cogenesiC.psd, cogregdC.o24.psd, coinspolD.o34.psd, coinspolX.psd, cojames.psd, colacnu.o23.psd, colaece.o2.psd, colaw1cn.o3.psd, colaw2cn.o3.psd, colaw5atr.o3.psd, colaw6atr.o3.psd, colawaf.o2.psd, colawger.o34.psd, colawine.ox2.psd, colawnorthu.o3.psd, colsigef.o3.psd, colsigewB.psd, colsigewZ.o34.psd, colwgeat.psd, colwsigeT.psd, colwsigeXa.o34.psd, colwstan1.o3.psd, colwstan2.o3.psd, comargaT.psd, coorosiu.o2.psd, cootest.o3.psd, coprefcath1.o3.psd, coprefcath2.o3.psd, coprefgen.o3.psd, coquadru.o23.psd, cosolsat1.o4.psd, cosolsat2.psd, cotempo.o3.psd, cowulf.o34.psd

Appendix: queries

In this page, all the queries that we used. The nodes are always NP*.

i. Figure 3a, Prenominal: ((NP* iDominates NP-GEN) AND (NP* iDominates N^*) AND (NP* iDominates (!CP-*|ADJ*|NUM*|Q^*|D^*) AND (NP-GEN iDomsOnly NR^G) AND (NP-GEN iPrecedes N^*))

   Tokens: 4792

ii. Figure 3a, Postnominal: ((NP* iDominates !ADJ*|CP-*|NUM*|Q^) AND (NP* iDominates N^*) AND (NP* iDominates NP-GEN) AND (NP-GEN iDomsOnly NR^G) AND (N^* iPrecedes NP-GEN))

   Tokens: 44

iii. Figure 3b, Prenominal: ((NP* iDominates NP-GEN) AND (NP* iDominates N^*) AND (NP* iDominates !CP-*|ADJ*|Q^*|NUM*|D^*) AND (NP-GEN iDomsOnly N^G) AND (NP-GEN iPrecedes N^*))

   Tokens: 3516

iv. Figure 3b, Postnominal: ((NP* iDominates NP-GEN) AND (NP* iDominates N^*) AND (NP* iDominates !CP-*|ADJ*|Q^*|NUM*) AND (NP-GEN iDomsOnly N^G) AND (N^* iPrecedes NP-GEN))

   Tokens: 245

v. Figure 4a, Prenominal, Proper Noun: ((NP-GEN iDomsOnly NRˆG) AND (NP* iDominates NP-GEN) AND (NP* iDominates !Dˆ*) AND (NP* iDominates Nˆ*) AND (NP* iDominates ADJ*|NUM*|Qˆ*) AND (ADJ*|NUM*|Qˆ* iPrecedes Nˆ*) AND (NP-GEN Precedes ADJ*|NUM*|Qˆ*))

Tokens: 72

vi. Figure 4a, Postnominal, Proper Noun: ((NP-GEN iDomsOnly NRˆG) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ*) AND (NP* iDominates ADJ*|NUM*|Qˆ*) AND (Nˆ* iPrecedes NP-GEN))

Tokens: 59

vii. Figure 4b, Prenominal, Common Noun: ((NP-GEN iDomsOnly Nˆ G) AND (NP* iDominates NP-GEN) AND (NP* iDominates !Dˆ*) AND (NP* iDominates Nˆ*) AND (NP* iDominates ADJ*|NUM*|Qˆ*) AND (ADJ*|NUM*|Qˆ* iPrecedes Nˆ*) AND (NP-GEN Precedes ADJ*|NUM*|Qˆ*))

Tokens: 63

viii. Figure 4b, Postnominal, Common Noun: ((NP-GEN iDomsOnly Nˆ G) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ*) AND (NP* iDominates ADJ*|NUM*|Qˆ*) AND (Nˆ* iPrecedes NP-GEN))

Tokens: 260

ix. Figure 4b, Prenominal, Determiner: ((NP-GEN iDominates Nˆ G) AND (NP-GEN iDominates Dˆ G) AND (NP-GEN iDominates !NP-GEN-PRN|CP-*) AND (Dˆ G iPrecedes Nˆ G) AND (NP* iDominates NP-GEN) AND (NP* iDominates !Dˆ*) AND (NP* iDominates Nˆ*) AND (NP* iDominates ADJ*|Qˆ*|NUM*) AND (NP-GEN iPrecedes ADJ*|Qˆ*|NUM*) AND (ADJ*|Qˆ*|NUM* Precedes Nˆ*))

Tokens: 54

x. Figure 4b, Postnominal, Determiner: ((NP-GEN iDominates Nˆ G) AND (NP-GEN iDominates Dˆ G) AND (NP-GEN iDominates !NP-GEN-PRN|CP-*) AND (Dˆ G iPrecedes Nˆ G) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ*) AND (NP* iDominates ADJ*|Qˆ*|NUM*) AND (Nˆ* iPrecedes NP-GEN))

Tokens: 554

xi. Figure 5a, Prenominal, Proper Noun: ((NP-GEN iDominates NRˆG) AND (NP-GEN iDominates ADJˆ*) AND (NP-GEN iDominates !NP-GEN-PRN|CP*) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ*) AND (NP* iDominates !ADJ*|NUM*|Qˆ*|Dˆ*) AND (NP-GEN iPrecedes Nˆ*))

Tokens: 108

xii. Figure 5a, Postnominal, Proper Noun: ((NP-GEN iDominates NRˆG) AND (NP-GEN iDominates ADJˆ*) AND (NP-GEN iDominates !NP-GEN-PRN) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ*) AND (NP* iDominates !ADJ*|NUM*|Qˆ*|Dˆ*) AND Nˆ* iPrecedes NP-GEN))

Tokens: 30

xiii. Figure 5b, Prenominal, Determiner: ((NP-GEN iDominates Nˆ G) AND (NP-GEN iDominates Dˆ G) AND (Dˆ G iPrecedes Nˆ G) AND (NP-GEN iDominates !CP*|NP-NOM-PRN) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ G) AND (NP* iDominates !ADJ*|NUM*|Qˆ*|Dˆ*) AND (NP-GEN iPrecedes Nˆ*))

Tokens: 2255

xiv. Figure 5b, Postnominal, Determiner: ((NP-GEN iDominates Nˆ G) AND (NP-GEN iDominates Dˆ G) AND (Dˆ G iPrecedes Nˆ G) AND (NP-GEN iDominates !CP*|NP-NOM-PRN) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ G) AND (NP* iDominates !ADJ*|NUM*|Qˆ*) AND (Nˆ* iPrecedes NP-GEN))

Tokens: 906

xv. Figure 5b, Prenominal, Modifiers: ((NP-GEN iDominates Nˆ G) AND (NP-GEN iDominates [1]ADJˆ*|[1]NUM*|[1]Qˆ*) AND (NP-GEN iDominates !NP-GEN-PRN|CP-*) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ*) AND (NP* iDominates ![2]ADJˆ*|[2]NUM*|[2]Qˆ*|Dˆ*) AND (NP-GEN iPrecedes Nˆ*))

Tokens: 1569

xvi. Figure 5b, Postnominal, Modifiers: ((NP-GEN iDominates Nˆ G) AND (NP-GEN iDominates [1]ADJˆ*|[1]NUM*|[1]Qˆ*) AND (NP-GEN iDominates !NP-GEN-PRN|CP-*) AND (NP* iDominates NP-GEN) AND (NP* iDominates Nˆ*) AND (NP* iDominates ![2]ADJˆ*|[2]NUM*|[2]Qˆ*) AND (Nˆ* iPrecedes NP-GEN))

Tokens: 1214

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