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Reconstructing the Old English analytic causative system

A diachronic corpus-based study

AUTHOR – AFFILIATION

Abstract

This paper investigates the structure and diachronic development of the Old English analytic causative system. It focuses on constructions involving a causative verb and either an infinitival complement or a finite clause introduced by *þæt* 'that'. Unlike previous studies, which have primarily focused on identifying the syntactic features of causative verbs, the present study adopts a corpus-based approach and provides a diachronic reconstruction based on empirical evidence. The dataset, consisting of over 1,500 causative constructions, is analysed by means of a multiple correspondence analysis, which shows that the main causative verbs, namely *hatan*, *(ge)don* and *lætan*, exhibit distinct distributional profiles and occur in different causative contexts. Although the relationships between the causative verbs remain stable throughout the Old English period, individual constructions show a greater degree of change. On this basis, the paper offers a reconstruction of the causative analytic network and traces how the dynamics between the constructions changed over time.

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1 Introduction

Old English possessed two main strategies to express causative relations. Firstly, causative verbs could be formed with the addition of the affix *-i(a)-* (from Germanic *-*(i)jō*-) to the preterite form of a strong lexical verb (Lass 1994). Examples are alternations like *ferian* 'carry' from *faran* 'go', *ræran* 'cause to rise, rear, raise' from *risan* 'rise, be fitting, becoming', or *driepan* 'moisten' from

dreopan ‘drop’ (van Gelderen 2018, García García 2020). The degree of productivity of morphological causatives, however, is questioned. Visser (1963-1973) and Lass (1994) argue that the causative function of *-i(a)-* was rather limited in Old English, as it can only be observed with a limited number of verbs such as *settan* ‘set’ (from *sittan* ‘sit’), while Ottosson (2009), van Gelderen (2011) and García García (2020) suggest that this formation strategy was still somewhat productive. Secondly, there existed analytic (or periphrastic) constructions, which were two-part configurations formed by a causative verb and either a finite or a non-finite complement introduced by *þæt* ‘that’ expressing a causal relation in which the occurrence of the effect is entailed. Examples of causative constructions complemented by an infinitive complement and a *þæt*-clause are provided in (1). The initiator of the entire causative event is the causer (i.e., *she* in (1a), *Sisinnius* in (1b) and *I* in (1c)), the entity that is changed or influenced by the causer is the causee (i.e., *the desire and the anger* in (1a) and *they* in (1c)), which could be left unspecified, as in (1b), while the verb heading the caused event is referred to as the effected predicate (i.e., *reign* in (1a), *beat* in (1b), and *fill* in (1c)).

(1) a. *Ðes dæð hire gelimpð gif heo læt rixian on hire ða gewilnunge*
This death her befalls if she lets reign in her the desire
and þæt yrre swyðor ðonne þæt gescead þe hi gewysigen sceall
and the anger rather than the reason that her direct should
to weldædum
to good deeds
‘This death befalls her if she makes the desire and the anger reign in her rather than the reason that should direct her to good deeds’ (coaelive,ÆLS_[Christmas]:148.118)

b. *Ða Sisinnius het swingan þone mæssepreost*
Then Sisinnius commanded beat the priest
‘Then Sisinnius had the priest beaten up’ (coaelive,ÆLS_[Denis]:230.5906)

c. *& to merigen ic gedo þæt hi beoð mid hlafe gefylled, þæt*
and to morrow ic make that they are with bread filled, that
ge witon þæt ic eom Drihten eower God.
you know that I am Lord your God.
'And tomorrow I make the be filled with bread, so that you know that I am the Lord your God.' (cootest,Exod:16.11.2995)

Old English causative verbs have been the subject of considerable attention both in traditional grammars and syntactic studies (e.g., Visser 1963-1973, Denison 1993) and in more specific contributions that address the development and the behaviour of constructions formed by a matrix verb and finite and non-finite complements (e.g., Fischer 1989, Timofeeva 2010a). These studies have predominantly focused on the syntactic properties of causative verbs and how they differ from other, structurally similar constructions such as perception verbs (Fischer 1989, Timofeeva 2010a), or dealt with the behaviour of individual verbs (Royster 1922, Timofeeva 2011, Lowrey 2012). The main goal of these works, which are mostly framed within a generative framework, was to determine the features that characterise the causative verb category in Old English. The analysis of the formal features has led to the identification of *(ge)don* 'do', *lætan* 'let' and *hatan* 'name, order, call' as the main members of the category, although not every scholar agrees on the causative status of *hatan* (e.g., Fischer 1989) and *(ge)don* (e.g., Los 2005). What characterises these verbs is the ability to occur in more or less fixed structures, as shown in the examples (1), could take both animate and inanimate causers and causees, and the causee is always in the accusative case.

These works, however, present a number of shortcomings. First, they have almost exclusively focused on the role of syntax while largely excluding semantic analyses from their investigations (e.g., Fischer 1989). Second, the dynamics underlying the different causative verbs and how they changed over time have not been investigated in detail, as most research has concentrated on describing the behaviour of individual verbs (e.g., Fischer 1989, Timofeeva 2010a,

Lowrey 2012). Third, although semantic typologies of causative events (e.g., Talmy 2000) have been successfully applied to Present-Day English causatives (e.g., Hollmann 2003, Gilquin 2010, Levshina et al. 2013), they have not yet been employed with causative verbs in Old English, an omission that would allow for a more comprehensive characterisation. Lastly, earlier studies tend to provide little to no accompanying statistical information (Royster 1922, Visser 1963-1973, Fischer 1989), with the exception of Timofeeva (2010) and Lowrey (2012), which include only basic quantitative measures such as raw and normalised frequency counts based on a limited selection of texts.

The goal of this paper is to bridge these gaps and offer a comprehensive treatment of the Old English analytic causative verb system which takes into account formal and functional variation and is grounded in a thorough corpus-based analysis. The main research questions that are addressed are the following: (i) What type of causative contexts did causative constructions encode in Old English? (ii) How did they interact with one another in the causative network? (iii) To what extent did the analytic causative system change throughout the Old English period? The data, which have been collected from the *York-Toronto Parsed Corpus of Old English prose* (YCOE, Taylor et al. 2003), are investigated by means of a multiple correspondence analysis that focuses on a number of semantic and syntactic features that include the semantic features of the causer and the causee, the semantics and the valency of the effected predicate, the type of event described by the effected predicate, the presence or absence of the causee and the syntactic realisation of the effected predicate. The results indicate that *(ge)don*, *lætan* and *hatan* present considerable differences with respect to the type of causative contexts in which they occur, with *hatan* being used exclusively in maximally agentive environments, while *(ge)don* appears more frequently in non-agentive contexts characterised by inanimate causers and causee and *lætan* lies somewhere in-between. In addition, while the behaviour of the *(ge)don, lætan* and *hatan* does not substantially change from early (-950) to late (950-1150) Old English, it appears that the individual constructions did undergo several changes. The results of the statistical analysis, which are plotted into a multidimensional space,

indicate the strength of the relationships entertained by the individual causative constructions and allow for a comprehensive representation of the Old English causative network.

The structure of this paper is as follows. Section 2 starts with a review of previous studies on Old English causative constructions (Section 2.1) and continues with a description of the causative model adopted in this study (Section 2.2). Section 3 outlines the methodological apparatus of this paper, which includes information on the corpus, the coding of the data and the statistical technique used. Section 4 reports the results of the analysis, which are then discussed in Section 5. Section 6 offers some concluding remarks.

2 Background

2.1 Causative constructions in Old English

Old English causative constructions have been the subject of several contributions over the years, see for instance Royster (1922), Visser (1963-1973), Fischer (1989) and (1992), Denison (1993), Timofeeva (2010), and Lowrey (2013). In a seminal study that investigates the origin and later spread of the so-called AcI (*Accusativus cum Infinitivo* 'accusative with infinitive') constructions, i.e., those patterns characterised by the presence of a main matrix verb that governs a noun phrase, realised in the accusative case, and an infinitive verb (as in *I want him to go to the store*, *I believe him to be honest*), Fischer (1989) laid out the main syntactic and semantic features that characterise Old English causative verbs. Differently from previous scholars (e.g., Visser 1963-1973), who include a large number of verbs within the causative verb category (Visser, for instance, considers verbs like *bodian* 'announce, proclaim', *gifan* 'give' and *sellan* 'give' as causatives), Fischer (1989: 187) argues that the only causative verbs in Old English are *lætan* and *(ge)don*, with *lætan* being the 'chief member' of the category. The main features identified by Fischer are the following (from Fischer 1989: 188):

a) They are followed by a bare infinitive (sometimes *(ge)don* is followed by a *to*-infinitive).

b) If the verb takes a *þæt*-clause (with *(ge)don* only), the syntactic pattern is always NP1 – Vcau – *þæt*-clause, never NP1 – Vcau – NP2 – *þæt*-clause.

c) The case of the NP2 is accusative.

d) The NP2 can refer to both animate and inanimate entities.

Point a) is what differentiates causative verbs from perception verbs like *(ge)seon* 'to see'. Fischer argues that causative and perception verbs behave quite similarly from a syntactic perspective, as both verbal classes take an infinitive complement and the subject of the infinitive is always marked by the accusative case. The main point of difference is then that perceptive verbs are also complemented by a clause introduced by *þæt*, while causatives, with the exception of *(ge)don*, do not. Point b) is concerned with the semantic structure of causative verbs. Formalist studies (e.g., Denison 1993) argue that causative verbs possess a two-place structure, as their thematic structure consists only of the causer and the clause headed by the verb expressing the effected predicate, with the causee being part of the argument structure of the effected verb (cf. the distinction between object raising and object control, see chapter 1 of Davies and Dubinski 2008 for an introduction). Therefore, in a construction like *he made his son play football*, arguments of causative *make* are *he* (the causer) and *his son play football* (clause). This is the reason why, according to Fischer, NP1 – Vcau – NP2 – *þæt*-clause patterns are not attested, as this type of surface structure imply that the causee is an argument of the causative verb which would, consequently, be analysed as a three-place verb. Point c) serves Fischer to distinguish between causative and permissive uses of *lætan*. In latter cases, *lætan* means 'allow, persuade' and occurs in constructions with a dative object, but it can sometimes appear complemented by a noun phrase and a *þæt*-clause too. Lastly, point d) is the reason why Fischer (1989) does not include *hatan* within the causative category. In her data, *hatan* is not attested in combination with inanimate causees, because the basic meaning of *hatan* assumes an animate causer and an animate causee (cf. Timofeeva 2010a, Lowrey 2012) and thus cannot be classified as causative. At the same time, however, Fischer (1989: 186) acknowledges the fact that

hatan could sometimes appear with a causative meaning, particularly in idiomatic phrases like *hateþ gretan*. The analysis that Fischer (1989) offers of *hatan* is that of a three-place verb that encompasses in its argument structure a subject, an object and a VP, and is therefore grouped within the 'persuade verb' category along with verbs such as *biddan* 'ask, bid' and *beodan* 'bid, command'.[1]

Fischer's (1989) account is based on generative grammar principles and the parameters she proposed are almost exclusively based on syntactic criteria that do not take into account semantic properties. Other studies, by contrast, take a different theoretical stance and combine in their analyses semantic and syntactic features, which results in different characterisations. The major point of discussion concerns *hatan* and whether it can be considered a causative verb. Royster (1922) is perhaps the first to look at *hatan* against the background of the Old English causative system and categorise it within the causative verb category. In Old English, *hatan* is frequently found in what Cloutier (2013) terms 'commanding constructions', i.e., constructions in which *hatan* is complemented by a noun phrase and an infinitive clause. In these contexts, the subject of *hatan* issues an order to another animate and agentive entity to perform a given action. Constructions in which the order issued is carried out are those that led Royster to suggest that *hatan* functioned as a causative verb. An example of causative *hatan* is provided in (2), where the order issued by the subject of *hatan*, i.e. king Æthelberht, to build a church is performed, as suggested by the context, since the action of endowing the church with a variety of gift would have not taken place if the church had not been built.

(2) *&* *lare* *Æðelberht* *se* *cyning* *weorðlice* *cyrcan* *heht* *getimbran*
and king Æthelberht the king splendid church commanded build
þara *eadigra* *apostola* *Petri* *&* *Pauli* *&* *mid* *missenlecum* *geofum*

[1] Note that Fischer however remarks that the features shown by *hatan* might not make it a central member of the persuade category.

of-the blessed apostles Peter and Paul and with many gift

welgade

endowed

'And king Æthelberht had a splendid church built in honour of Saint Peter and Saint Paul and endowed it with a variety of gifts' (cobede,Bede_1:17.90.18.827)

On the other hand, the examples in which the order issued by the subject of *hatan* is not accomplished, or where there is uncertainty whether it was performed, profile the use of *hatan* as an ordering verb and not as a causative (cf. Royster 1918, Lowrey 2013). Following Kartunnen (1971), Lowrey (2013) labels this distinction 'implicative' (i.e., causative) and 'non-implicative' (i.e., non-causative) uses of *hatan*, while Royster refers to them as 'perfective' and 'imperfective' uses. An example in which *hatan* is used with the 'order' (i.e., non-implicative or imperfective) meaning is given in (3), where the order issued by the king has not been carried out, as indicated by the following sentence in which it is explicitly expressed that the order has not been executed.

(3) *Þa het se cyning ða anlicnysse towurpan. Þaet folc ða*

Then ordered the king the image cast-down. The people the

caflice mid rapum hi bewurpon, & mid stengum awegdon; ac

promptly with ropes it cast, and with poles levered; but

hi ne mihton for ðam deofle þa anlicnysse styrian.

they not could for that devil the image stir.

Then the king bade to cast down the image. The people promptly cast it with ropes and levered it with poles, but they could not, for the devil, stir the image.'

(ÆCHomI,31:444.153.6203)

Timofeeva (2010) too considers *hatan* as a causative verb and observes that it occurred almost exclusively with animate causers and causees. The figures reported in her study indicate that a substantial share of all *hatan* constructions are those in which the causee is left unexpressed, which Lowrey (2012) calls "fully agentive causation". Despite the causee is syntactically absent, the agentive meaning of the infinitive verb implies that the subject has to be an animate entity. Lowrey (2012) observes that in these constructions the infinitives are telic and always express accomplishments (see Dowty 1979 on the definition of accomplishments). One characteristic that was already noted by Royster and that has been stressed in later studies concerns the high frequency with which causative *hatan* appears in Old English texts. Timofeeva (2010), which is the only study to adopt a corpus-based approach, has calculated that *hatan* occurs with a frequency of 7.66 words per 10,000 words. She suggests that such a high frequency is due to text-type, as *hatan* is particularly common in lives and homilies composed by Ælfric, which account for nearly half of the total occurrences found (Timofeeva 2010a: 108).

Lowrey (2012) notes that when the verb expressing the effected predicate is a stative verb or the causee is a non-agentive entity, *(ge)don* complemented by a *þæt*-clause is the typical construction that we find in Old English texts. It is for this reason, then, that he contrasts *(ge)don* with *hatan*, claiming that the two verbs are, to a certain extent at least, in complementary distribution. In addition, Lowrey (2012) argues that the main determinant in the use of causative *(ge)don* is the presence of a non-agentive causee. He further suggests that these cases should be treated as instances of 'indirect causation', although it is not clear what this term refers to in his account. A different analysis is proposed by Los (2005), as she argues that *(ge)don* did not function as a causative in constructions where it takes a *þæt*-clause, but that it should be considered as a verb of permitting. She finds that *(ge)don* was used in supplications, which indicate that it was not typically employed to express peremptory request or causation in the strictest sense (see examples in Los 2005: 135). The development of a causative use is placed by Los (2005) in Middle English, when *(ge)don* becomes more frequent with infinitival complements. Such a development from

polite request in Old English to causative in Middle English "has parallels and precedents with other verbs in this class" and thus would not be unconventional (Los 2005: 135). What is less expected, however, is the fact that *(ge)don* does not appear in constructions with a NP2 and a *þæt*-clause, as permitting verbs typically appear in this pattern but, despite this anomaly, Los (2005: 136) argues that "we can apparently generalize that it expresses causation when occurring with an AcI (e.g., Accusativum cum Infinitivo), and polite requests when occurring with a *that*-clause".

Next to *(ge)don – þæt*-clause constructions, which are robustly attested in Old English data, there are also a few instances in which *(ge)don* is complemented by an infinitive verb. Given the low frequency of the infinitival construction, Timofeeva (2010) argues that this pattern fully developed only during the Middle English period, when its frequency of use increased. Furthermore, most of the occurrences in Old English appear in the later part of the period and are attested in translations from Latin and glosses (cf. Ellegård 1953, Timofeeva 2011), which led some scholars to wonder whether the origins of *(ge)don* – (NP2) – inf can be found in an internal development or are the result of language contact, particularly with Latin. In an early treatment of the infinitive in Old English, Callaway (1913) argues that *(ge)don* – (NP2) – inf was patterned after its Latin counterpart *facere* 'do' – inf, attributing then the origin of the construction to Latin influence. Ellegård (1953) agrees with Callaway (1913) that Latin played a crucial role on the basis of the fact that most of the occurrence are translation of an original Latin causative construction involving *facere* 'do' and an infinitive verb. More recent studies, however, tend to believe that *(ge)don* – (NP2) – inf is a native Old English development (Fischer 1989, Los 2005, Timofeeva 2011), noting that the borrowing of syntactic material is more complex than lexicon, as it requires several stages before it can take place (cf. Heine and Kuteva 2003). In addition, the proportion of Anglo-Saxon-Latin bilingual language users was extremely low in Old English (Timofeeva 2010b suggests between 0.27 and 0.55 per cent of the population), which makes a Latin origin even more unlikely. At the same time, it cannot be excluded that Latin had a more marginal role, perhaps in the establishment of the construction.

Causative *lætan*, as anticipated above, has been considered the main member of the causative category (Fischer 1989). Timofeeva's (2010) corpus analysis appears to confirm its centrality in the causative system, as the verb is frequently attested in causative constructions in Old English texts and appears in combination with both animate and inanimate causers and causees. Investigating the differences between constructions with and without the causee, Timofeeva (2010a: 96) suggests that *lætan* – inf examples should be interpreted as highly co-lexicalised patterns. This type of use is reminiscent of modern constructions such as *let-go*, *let-run*, *let-fall*, with the difference that the Present-Day English counterparts are characterised by the fact that the infinitive verb is typically intransitive. Furthermore, she argues that the linguistic proximity of *lætan* and the infinitive reflects the conceptual closeness of cause and result (see also Haiman 1985: 108-111) and that this construction type should be interpreted as "a transitional stage between periphrastic and morphological causatives", which would culminate in the development of constructions like *let-fall* into *throw*, *let-stand* into *leave*, *let-go* into *release* and more. A completely divergent position is offered by Lowrey (1922: 353), as he argues that *lætan* in these constructions has lost most of its semantic content and merely functions as a marker of past tense, which would be paralleled by another periphrastic structure like the impersonal *man*-construction. Importantly, *lætan* – inf causative constructions are considered to be stronger than those in which the causee is expressed, which are characterised by a higher number of intransitive infinitives (Timofeeva 2010a: 103).

In addition to these verbs, there are other ones that are rarely used as causatives, such as *bebeodan* 'command, bid' and *biddan* 'ask, entreat' (cf. Timofeeva 2010a: 118-130). Lastly, in light of its future development and establishment as the most frequent causative verb in the Middle English period, a few words should be devoted to *macian*, the ancestor of Present-Day English *make*. It is well-known that the verb *macian* was an infrequent construction in Old English (Royster 1922, Ikegami 1981). The first attestations of *macian* as a causative verb appear in late Old English. Originally, it appears in constructions in which it is complemented by a small clause and mostly combines with inanimate and non-agentive causers and causees (Lowrey 2012). There is only a

limited number of examples where *macian* takes an infinitive verb in Old English, but its use increases substantially already in early Middle English, when it is already more frequent than *do* and occurs in a great variety of contexts (AUTHOR 2022). Given the small number of attestations, instances of causative *macian* have not been included in the statistical analysis presented in section 4.

2.2 Semantic models of causation

Causation has been characterised as a "basic human concept" that speakers use to "organize their physical and cultural realities" (Lakoff and Johnson 1980: 69). It is perhaps for this reason that causative constructions have attracted a great deal of attention in modern linguistic research, to such an extent that Kemmer and Verhagen (1994: 115) argue that they have "inspired what is probably one of the most extensive literatures in modern Linguistics". As a result, a number of theories of causation have been proposed, particularly in studies that address causative constructions from a typological perspective (e.g., Shibatani 1976, Song 1996, Dixon 2000). The majority of these theories are grounded in formal, generative approaches to language, as causatives involve the interaction of syntax, morphology and semantics and thus represent an ideal testing ground for formalist linguistics.

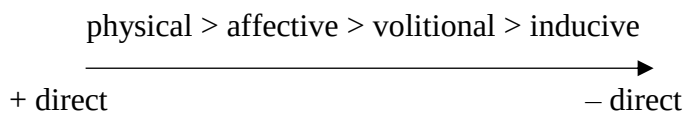
A semantic typology of causatives that has been fruitfully employed in works on Present-Day English causative constructions (Hollmann 2003, Gilquin 2010) is the one proposed by Talmy (1976) and then further developed and schematised by Croft (1991) and Verhagen and Kemmer (1997). This account rests on the assumption that causative events are distinguished along two dimensions. The first involves a fundamental distinction between the initiator and the endpoint of the causative situation. The underlying assumption is that every causative event comprises an initiator, i.e., the causer, and an endpoint, i.e., the causee or the affectee. The initiator/causer is the entity that acts on or enters into a causal relationship with another entity, while the endpoint is the entity that is acted upon by the initiatior. The endpoint may correspond to the causee if the effected

predicate is an intransitive verb (e.g., *He made the baby cry*) or to the affectee if the effected predicate is a transitive verb (e.g., *He had him build a house*). The second dimension is concerned with a semantic distinction between animate and inanimate entities. In Talmy's (1976) account, animate entities are those who possess and exercise a mental capacity by means of planning, intending, conspiring etc., while inanimate entities are characterised as non-sentient, non-volitional entities (cf. Croft 1991: 167). The intersection of these parameters yields the four principal types of causative events: (i) inducive causation, which involves an animate causer and an animate causee (e.g., *The teacher made the students write an essay*), (ii) volitional causation, which involves an animate causer and an inanimate causee (e.g., *She made the computer restart*), (iii) affective causation, which involves an inanimate causer and an animate causee (e.g., *The movie made them cry*), and (iv) physical causation, which involves an inanimate causer and an inanimate causee (e.g., *The explosion caused the wall to collapse*).

In addition to these distinctions, causative constructions can be further analysed with respect to a range of semantic, syntactic and morphological properties. Dixon (2000: 62) proposed nine semantic parameters that appear to characterise causative constructions in a number of languages across the world. One parameter that is particularly relevant to the discussion in Section 5 is that of directness. Although several scholars have discussed the notion of directness in causative constructions, providing a definition of directness is not an easy exercise, as linguists have conceptualised it in different ways and a uniform definition is still lacking. Fischer (1995: 11-12), for instance, attributes directness to several factors, namely whether the causer directly causes what is expressed by the effected predicate, the presence of an inanimate causer, and an active participation of the animate causee in the realisation of the caused event. Verhagen and Kemmer (1997) focus exclusively on whether there is an intermediate source of energy besides the causer: in cases where there is no intervening energy source, causation is direct, while it is considered indirect when another force is recognised as the most immediate source of energy in the caused event. Furthermore, based on the assumption that one cannot directly influence another's mental states,

Kemmer and Verhagen (1997) argue that animate entities can affect other animates only through mediation by the physical world, while physical, inanimate entities are conceived as being capable of direct acting on others (cf. Croft 1991: 167). In addition to presence vs. absence of an intermediary force, Dixon (2000: 70) reports that in languages such as Hungarian and Chrau directness refers to whether the causer tells the causee to carry out an action, in which case the causative situation is assumed to be indirect.

Combining directness and different causative contexts, Verhagen and Kemmer (1997: 72) propose that causative contexts can be ordered along a continuum that ranges from prototypically direct to prototypically indirect. At one end lie physical contexts, which involve inanimate causers and causees and are considered to express direct causation, while at the other end are inducive contexts, characterised by animate causers and causees and thus assumed to convey indirect causation. Volitional causation is also an instance of indirect causation, whereas affective causation is more complex to characterise, as it is not prototypically direct or prototypically indirect. The continuum proposed by Verhagen and Kemmer (1997) can be represented in the following way:



3 Data and methodology

3.1 Corpora, data collection, and annotation

The data used in this article stem from the *York-Toronto Parsed Corpus of Old English prose* (YCOE, Taylor et al. 2003). YCOE includes about 1.5 million words from 100 prose texts composed up to 1150, but only texts for which it was possible to assign a (approximate) date of composition were considered in this study. The final dataset thus contains of 46 texts that account for 1,191,351 words. The dataset was then further divided into two periods, namely early Old English (-950) and late Old English (950-1150), which account for 520,326 and 671,025 words,

respectively. The causative constructions were extracted using the software AntConc (Anthony 2020). Initially, I extracted every occurrence of *hatan*, *lætan*, and *(ge)don* in combination with an infinitive verb or a *þæt*-clause using the relevant PoS (part-of-speech) tags.[2] The dataset was then cleaned up of all those cases in which the verbs under investigation were not used as causative verbs. *(Ge)don* with a *þæt*-clause could, for instance, be used in constructions where the whole meaning would translate in Present-Day English as 'he did X in order to Y'. Furthermore, instances in which *hatan* expressed an order without implying its realisation (see the discussion in section 2.1) were manually removed from the dataset. The final version of the dataset accounts for 1,530 constructions, of which 604 from early Old English (-950) and 926 from late (950-1150) Old English. The tokens were then manually annotated according to a number of semantic and syntactic features that are known to influence causative constructions and are discussed below. The coding was carried out on the basis of previous research on causative constructions in Old English (e.g., Timofeeva 2010a) as well as in Present-Day English (Gilquin 2010), and typological studies (Levshina et al. 2013). Note that a factor that is usually reported as significant in other studies on causative constructions, namely a semantic analysis based on the meaning of the effected predicate, was not included in the present study. This is due to the fact that there were several cases in which an appropriate categorisation of a verb in a given semantic class similar to what Levshina et al. (2013) and AUTHOR (2022) used for Present-Day English and Middle English was rather complex and would have caused uncertainty that could have affected the analysis. Instead, other variables concerned with the valency and the type of event expressed by the effected predicate have been included.

- Causative verb: three-way distinction that includes all the causative verbs included in the study, namely *hatan, (ge)don, lætan*.

[2] The Bosworth and Toller's Anglo-Saxon Dictionary was consulted to retrieve all the different forms of the three verbs.

- Constructions: multiple distinction that includes the individual causative constructions, which are the following: *hatan* – inf, *hatan* – NP2 – inf, *hatan* – (NP2) – *þæt*, *lætan* – inf, *lætan* – NP2 – inf, *(ge)don* – *þæt*, *(ge)don* – (NP2) – inf. The constructions *hatan* – NP2 – *þæt* and *hatan* – *þæt* were merged into a single construction *hatan* – (NP2) – *þæt* due to the very low frequency of occurrence, see Table 2 below. The same holds for *(ge)don* – NP2 – inf and *(ge)don* – inf, which were collapsed into *(ge)don* – (NP2) – inf.
- Causer: the semantic features of the causer were divided into animate (e.g., *Lewis made the son go to bed*) and inanimate (e.g., *laziness caused him to lose his job*). A further distinction of inanimate causers between abstract entities and material objects in line with Levshina et al. (2013) was not carried out, as there is only a handful of causers expressing material objects and their inclusion would have negatively impacted the robustness of the statistical model due to data sparsity.
- Causee: the semantic features of the causee were divided into animate (e.g., *Luka made his friend buy a new watch*) and inanimate (e.g., *Luka made the truth come out*). In cases where the causee was left unexpressed, I relied on indirect evidence (e.g., context and general knowledge) to assign the semantic class. Where this was not possible, the examples were excluded by the analysis. The reasons for not further distinguishing between abstract and material object causees are the same as those outlined above for the causer.
- Complement: this variable represents the different types of complement of the effected predicate, as it could be expressed by an infinitival complement or a clause introduced by *þæt*.
- Semantics of the infinitive verb: three-way distinction that includes transitive (e.g., *he baked the caked*), unaccusative (e.g., *the ice melted*) and unergative (e.g., *he ran to the hotel*) verbs.
- Event expressed by the effected predicate: two-way distinction distinguishing between verbs that express a state (e.g., *love, think*) or a dynamic action (e.g., *run, cook*).

- Subject of the infinitive: two-way variable concerned with the presence (e.g., *he made him run*) or the absence (e.g., **he made run*) of the causee. When either the causer or the causee were not expressed, the analysis relied on contextual clues in determining their semantic features. In cases where this was not possible, such examples were excluded from the statistical analysis.

3.2 Statistical analysis

The dataset was submitted to a multiple correspondence analysis (MCA, Levshina 2015: 375–385, Husson et al. 2017, see also Greenacre 2017). MCA is an exploratory, bottom-up statistical method used to uncover frequency-based associations in order to identify systematic relations and patterns between variables. MCA take as input large frequency tables which, on the basis of distance-based clustering technique, are transformed to produce a graphical illustration in which every variable included in the study is visualized as a point. This means that, in the present case, all the levels of the categorical variables described above (e.g., CSR:Animate, CEE:Inanimate, etc.) are represented by a point and plotted into a multidimensional space. The different causative verbs and the individual constructions (e.g., *(ge)don* – NP2 – inf, *hatan* – inf, etc.) are not considered in the creation of the semantic-functional space, but they are mapped onto it (Levshina, 2015: 378–379). Supplementary variables in fact do not contribute to define the geometry of the MCA, but are simply projected onto the semantic-functional space after the plot is computed from the active variables and are useful for visualization and interpretation. This procedure created two plots in which the positions of the active variables do not change, but the ellipses of the causative verbs and the location of the constructions do: this allows us to compare them and determine whether their distributional profiles changed over time. The interpretation of the results is carried out on the basis of the relative positions of the points and their distribution along the dimensions. This implies that the more similar the categories become in distribution, the closer they are represented on the map.

All statistical analyses were conducted in R (R Core Team, 2020). Frequency distributions were visualised with the package 'ggplot2' (Wickham, 2016), while multiple correspondence analyses were carried out using 'FactoMineR' (Lê et al., 2008) and selected functions from the package 'ca' (Nenadić and Greenacre, 2007).

4 Results

This section reports on the results of this study. Section 5.1 provides some basic frequency counts of the causative verbs and the individual constructions. Section 5.2 reports on the results of the multiple correspondence analyses.

4.1 Frequency distribution

Table 1 provides the raw frequency and the normalised frequency x100,000 words of *(ge)don*, *hatan*, and *lætan* in the dataset. The most frequent causative verb in both early and late Old English is *hatan*, whose frequency increases over time. Causative *lætan* is well-attested in Old English texts, although its frequency decreases in late Old English, while *(ge)don* is the least frequent causative verb overall. Figure 1 provides further information on the proportional distribution of the causative verbs in the dataset. Causative *hatan* accounts for the greatest portion of causative constructions in both sub-periods, ranging from 65% of early Old English to nearly 80% in late Old English. Causative *lætan* goes from 25% in early Old English to 13% in late Old English, while *(ge)don* fluctuates between 7% and 10% of the total amount of causative verbs.

	Early Old English		**Late Old English**	
	Raw freq.	*n* x100,000 words	Raw freq.	*n* x100,000 words
(ge)don	45	8.64	83	12.36
hatan	400	76.87	712	106.10

lætan	159	30.55	131	19.52
Total	604	116.08	926	137.89

Table 1: Raw and normalised frequency (x100,000 words) of *(ge)don*, *lætan* and *hatan* in the dataset used in this study.

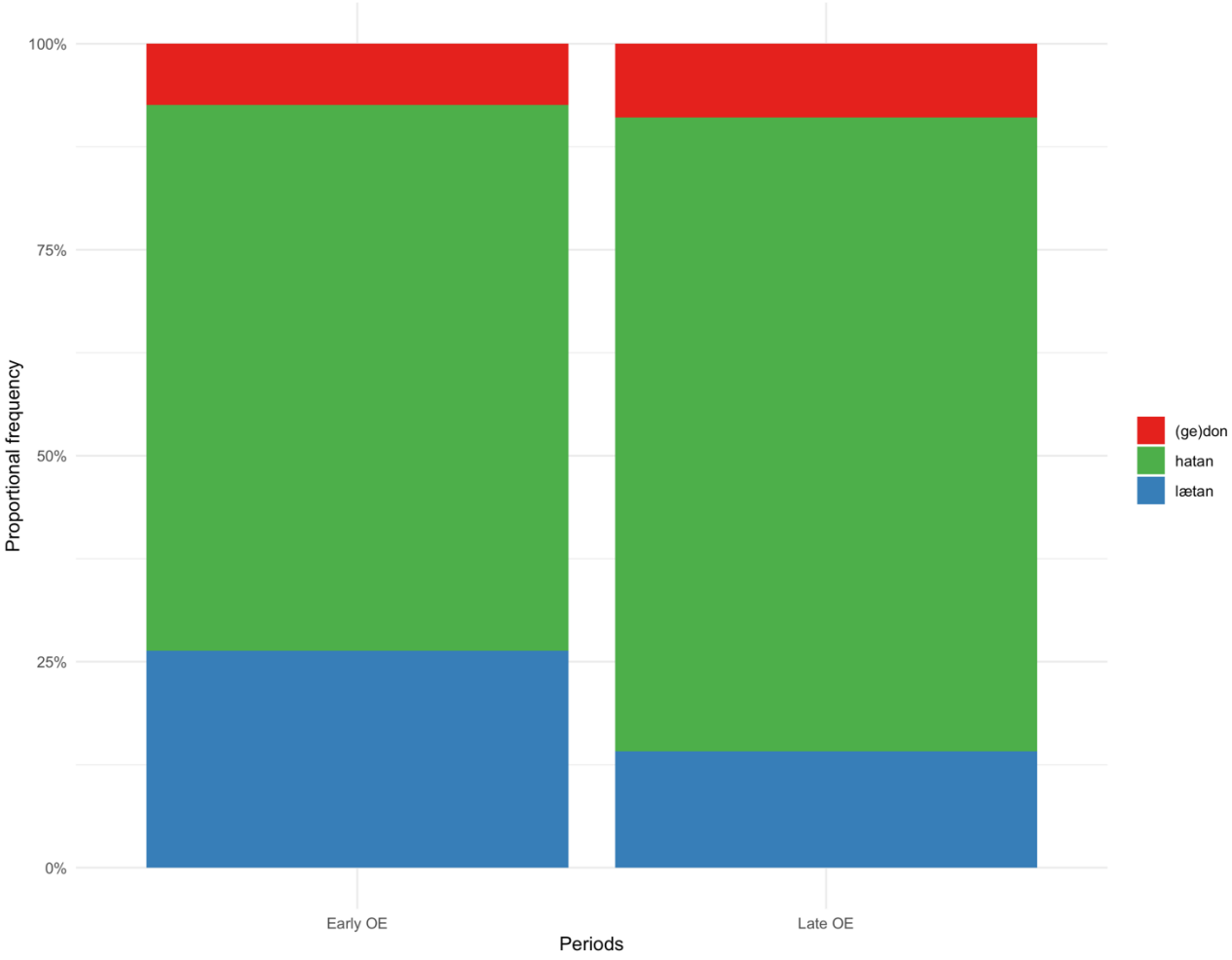


Figure 1: Proportional distribution of *(ge)don*, *hatan*, and *lætan* in early (left) and late (right) Old English.

Table 2 and Figure 2 provide some more detailed information concerning the individual constructions. As can be seen, *(ge)don*, *lætan*, and *hatan* show strong preferences in terms of the types of complement they take. Firstly, it appears that infinitival complementation is rather infrequent with *(ge)don*, which prefers finite clause introduced by *þæt*; as Figure 2 indicates,

(ge)don – *þæt*-clause accounts for 90% of all the causative constructions involving *(ge)don*. *Hatan*, on the other hand, strongly favours infinitival complements, which represent nearly the totality of the causative constructions involving *hatan*. Lastly, we see that *lætan* is not attested with *þæt*-clauses in causative constructions and shows no clear preference between constructions with and without an overt causee, although the frequency of *lætan* – inf constructions decreases in late Old English.

	Early Old English		**Late Old English**	
	Raw freq.	*n* x100,000 words	Raw freq.	*n* x100,000 words
(ge)don – inf	0	0	2	0.29
(ge)don – NP2 – inf	1	0.19	4	0.59
(ge)don – *þæt*	44	8.45	77	11.47
hatan – inf	308	59.19	480	71.53
hatan – NP2 – inf	75	14.41	195	29.06
hatan – *þæt*	8	1.53	29	4.32
hatan – NP2 – *þæt*	9	1.72	8	1.19
lætan – inf	92	17.68	40	5.96
lætan – NP2 – inf	67	12.87	91	13.56
Total	604	116.08	926	137.89

Table 2: Raw and normalised frequency (x100,000 words) of the individual causative constructions in the dataset used in this study.

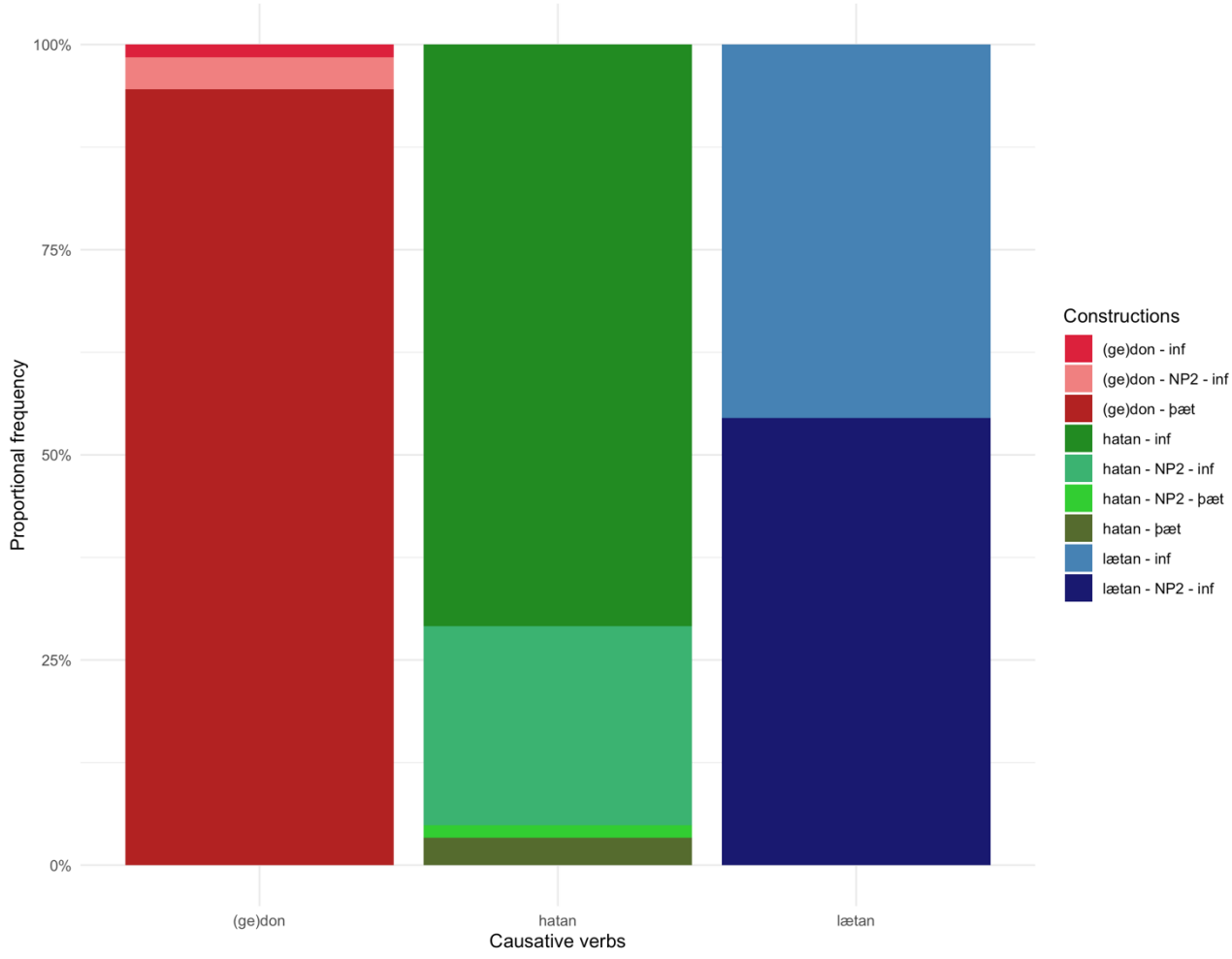


Figure 2: Proportional distribution of every construction for each individual causative verb.

4.2 Multiple Correspondence Analysis

As mentioned in Section 3.1, the dataset was divided into early (-950) and late (950-1150) Old English. This periodisation will allow us to determine whether, and if so to what extent, causative constructions have changed during the Old English period. In order to ensure a meaningful comparison between the two subperiods, the MCA was run on the entire dataset and then split into early and late Old English. Recall that only the semantic and syntactic features described in Section 3.1 (e.g., semantics of causer and causee, semantics of the effected predicate, valency of the effected predicate, etc.) were used as active variables, while the causative verbs and constructions variables were treated as supplementary variables. To facilitate the interpretation of the results, it

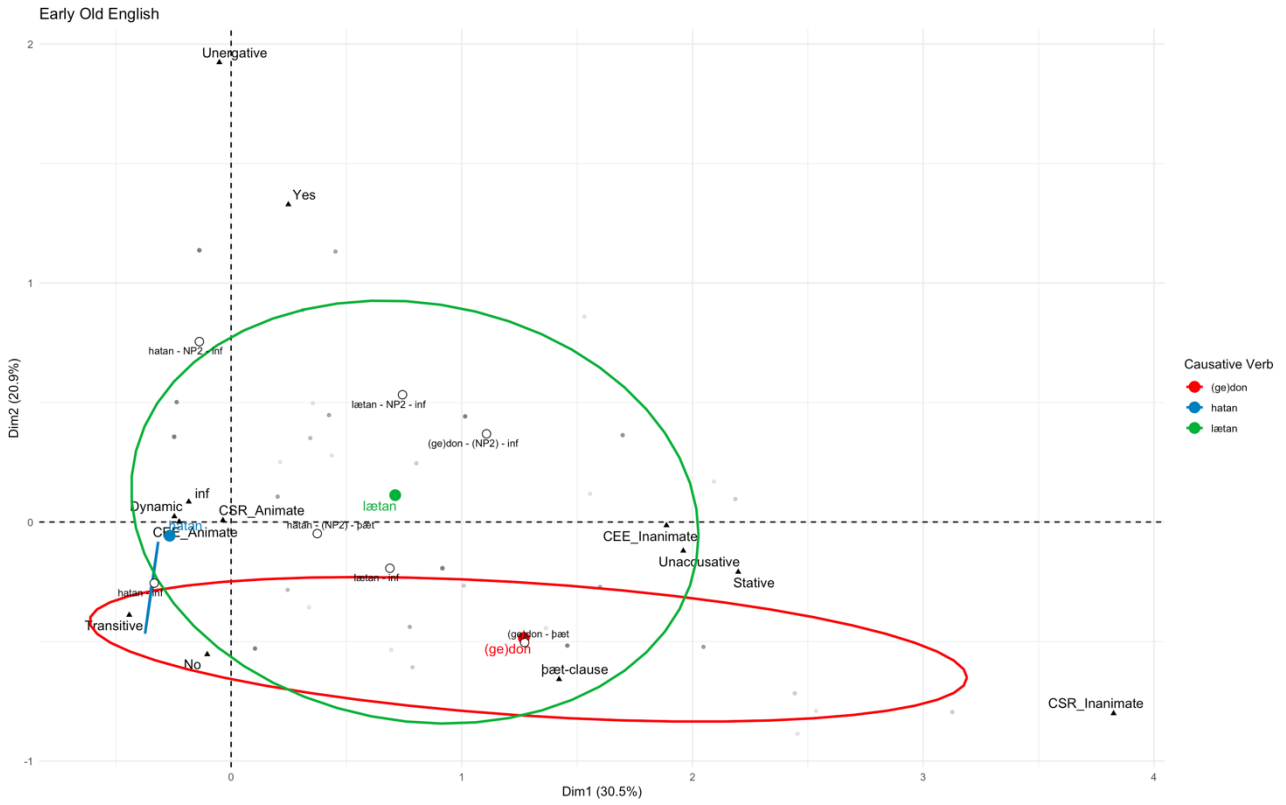
should be born in mind that the center, or the origin, of the plot corresponds to the centroid of each variable, which means that the closer the position of a specific variable is to the origin, the closer that variable is to the average profile. Furthermore, the model draws 95% confidence ellipses around exemplars of the constructions, which serve to determine whether the categories of a categorical variable, in this case the causative verb variable that includes *(ge)don*, *hatan* and *lætan*, are significantly different from one another.

Before looking at the results, let us first assess the performance of the statistical models and look at the proportions of variability that can be explained by the different dimensions, examine the extent to which the included features predict the variation between the constructions in the respective periods, and determine how many dimensions (axes) should be considered (typically the fewer the better). The amount of information produced by each dimension is referred to as eigenvalues or principal inertias (see Table 3). It should be born in mind that regular MCA tend to under-estimate proportions of variance, and for this reason adjusted, more realistic percentages that are calculated using the function 'mjca' in the R package 'ca' (Nenadic and Greenacre 2007) are also provided (see Glynn 2014: 450, Greenacre 2017, Levshina 2015: 382). The dimensions are arranged according to the proportion of variance they explain, with the most explanatory dimensions listed first. The '% cumulative adjusted' column displays the cumulative adjusted percentage for each dimension, showing the running total. The scree plot in the final column visualises the relative contributions of the individual dimensions. The overall performance of the model is satisfactory, which suggests that the features included in the analysis are relevant in predicting the variation of causative constructions in Old English. The variance explained by the first two dimensions is close to 78%, which is overall a good result, and the choice of two dimensions is justified, as the addition of further dimensions would not add much to the models.

Dim	Value	% Non-adjusted	% Adjusted	% Cumulative adjusted	Scree plot adjusted

1	30.5	30.5	65.9	65.1	**********
2	20.9	51.4	11.8	77.7	*****
3	14.7	66.1	3.5	81.2	*

Table 3: Principal inertias (eigenvalues) of the multiple correspondence analysis (non-adjusted/adjusted values), first three dimensions.



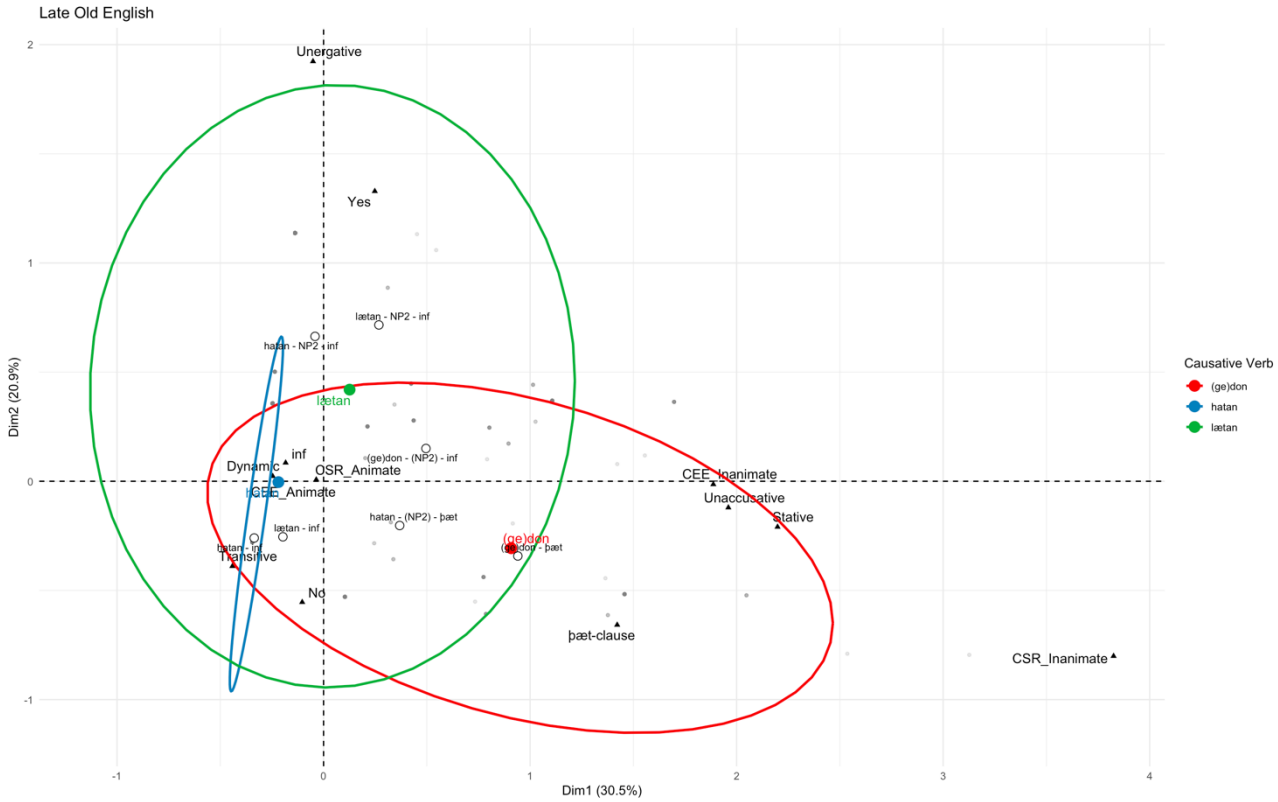


Figure 3. MCA biplot of dimensions 1 and 2 for early (top panel) and late (bottom panel) Old English data, with causative verbs (full colour dot) and individual constructions (white dot) as supplementary variables, variables (features) marked by a black triangle, individual exemplars in grey, and 95% confidence ellipses around exemplars of the causative verbs.

Figure 3 presents the results of the multiple correspondence analyses conducted for early Old English (top panel) and late Old English (bottom panel). In the early Old English data, Dimension 1 separates *hatan*, located on the left-hand side of the plot, from *(ge)don* and *lætan*, both positioned on the right-hand side. Within the right-hand section, Dimension 2 further distinguishes between *(ge)don* and *lætan*, with the latter situated in the upper-right quadrant close to the horizontal axis, and the former in the lower-right quadrant. The position of the verbs in the different areas of the multidimensional space suggests that some degree of functional differentiation was already present among the causatives in this period. At the same time, the ellipses generated by the model indicate that these distinctions were not clearly defined, since the intersections of the ellipses reveal substantial functional overlap, particularly between *(ge)don* and *lætan*, whose distributional profiles appear to be aligned to a certain extent.

Constructions involving *hatan* group closely with animate causers, animate causees, transitive predicates and dynamic verbs. The slim, almost non-existent ellipsis computed by the model for *hatan* indicates that the distribution of the individual exemplars is concentrated almost exclusively in the same area, suggesting minimal degree of variation. These results are consistent with the characterisations offered by Royster (1918), Timofeeva (2010a), and Lowrey (2013b), who describe *hatan* as restricted to agentive causative contexts. By contrast, *(ge)don* is positioned near features such as inanimate causees, *þæt*-clauses and stative and unaccusative verbs. The same part of the plot also hosts variables relating to inanimate causers, although in a more peripheral position. Lastly, in the vicinity of *lætan* we find variables such as animate causers and causees, and also unaccusative and dynamic verbs. This part of the plot also features, though more peripherally, the variable concerned with unergative verbs.

Taken together, these associations allow for a preliminary characterisation of the three causatives in early Old English. *Hatan* was exclusively used in inducive causative contexts, where both causer and causee are animate entities. *(Ge)don* was typical of contexts involving inanimate causative contexts, especially physical causation with inanimate causers and causees. *Lætan* displayed a broader range than the other two verbs, occurring both in volitional contexts (animate causer and inanimate causee) and in inducive contexts (animate causer and animate causee).

A further noteworthy aspect of the early Old English causative system concerns the positioning of the individual constructions relative to the prototypical locations of the causative verbs. In some cases, such as *(ge)don* – *þæt*, the construction nearly perfectly overlaps with the prototype, indicating that it represents the typical realisation of the causative meaning associated with *(ge)don*. Constructions involving *hatan* are also clustered tightly together, with *hatan* – inf being the closest to the prototype. At the same time, there are other constructions that diverge more noticeably from the causative verb. For instance, although relatively infrequent (see Table 1), *(ge)don* – (NP2) – inf is positioned within the ellipsis of *lætan*, suggesting a substantial degree of functional convergence. *Lætan* – inf occurs in the same part of the map of *(ge)don*, while *hatan* – (NP2) – *þæt*-clause is

positioned close to *lætan*, indicating that there was a good degree of variation at the level of the individual constructions.

The association of *lætan* with unaccusative verbs and causees denoting inanimate causees appears to be strongly influenced by the high frequency of formulaic examples such as (4). In these cases, *lætan* occurs in fixed instructional phrases found in medical handbooks, particularly Bald's *Leechbook* and *Lacnunga*, which contain recipes for potions and remedies that often conclude with imperatives such as 'let stand', 'let cool', or 'let reek' a given preparation (see also Timofeeva 2010a: 95).

(4) *Genim feldmoran gecnuca swiðe lege in win oððe in eala læt*
Take parsnip beat very lay in wine or in ale let
standan ane niht oððe twa
stand one night or two
'Take a parsnip, beat it intensely, lay it in wine or ale and let it stand one or two nights'
(colacnu,Med_3_[Grattan-Singer]:58.1.345)

Let us now turn to the plot showing the results for the late Old English period (c. 950–1150) (bottom panel of Figure 3). The overall distribution of the prototypes does not change substantially compared to the early period, with the notable exception of *lætan*, which has moved closer to the centre of the plot. *Hatan* remains strongly associated with highly agentive causative contexts, while *(ge)don* continues to cluster with more inanimate contexts characterised by stative and unaccusative predicates. *Lætan*, as before, spans a range of causative contexts; however, its ellipsis has expanded considerably and now overlaps not only with *(ge)don* but also with *hatan*, suggesting an increase in its functional versatility of *lætan* and major distributional overlaps with *hatan*.

The most striking developments are found in the positioning of the individual constructions. At the prototype level, stability seems to predominate, as *(ge)don – þæt*-clause still nearly perfectly

overlaps with the prototype *(ge)don*, and *hatan* – inf remains closely aligned with *hatan*. By contrast, the profile of *lætan* shifts more noticeably. Whereas in the early period the construction closest to the prototype was *lætan* – inf, in the late period this role is assumed by *lætan* – NP2 – inf. The position of *lætan* – inf undergoes a remarkable change. In early Old English, it was located in the part of the plot that features *(ge)don*, while now it occurs much closer to *hatan* – inf, clustering with variables such as animate causers, animate causees, transitive predicates and dynamic verbs. These data point to an almost perfect overlap and considerable interchangeability between *hatan* – inf and *lætan* – inf in the late Old English period, a development already noted by Timofeeva (2010) and Lowrey (2013). Both scholars argue that the two constructions were in competition, a process that culminates in the early Middle English period, when *hatan* declines in frequency and *lætan* – inf replaces it. As Lowrey (2013: 38) observes, this replacement amounted to a "fairly straightforward lexical swap". Example (5) illustrates this interchangeability, showing that *hatan* – inf or *lætan* – inf could be used in the same causative contexts.

(5) a. *& se cyng hi let bryngan to Westmynstre myd micclan*
and the king them let bring to Westminster with much
wurðscipe
worship
'and the king had them brought to Westminster with much worship'
(cochronE,ChronE_[Plummer]:1075.30.2724)

b. *seo eorðstyrung hine geegsode þearle. het swa þeah*
the earthquake him frightened severely. commanded so yet
hi gebringan binnan ðam cweartene.
her bring in the prison.

‘the earthquake exceedingly terrified him. Yet, he had her brought in prison.’

(coaelive,ÆLS[Agatha]:180.2129)

Another relationship visible already in the early Old English data and that persists into the late period is the one concerning *(ge)don* – NP2 – inf and *lætan* – NP2 – inf. Their positions within the plot suggest that these constructions were still functionally similar and could occur in overlapping syntactic and semantic environments, although they appear to be slightly more distant in late Old English. Examples (6)–(7) illustrate the similarities between the two constructions and the degree of overlap in their distribution. In both examples, the causative constructions depict a situation in which the causer, *God*, makes the sun shine over the evil and the good. The syntactic pattern is the same, as we observe the presence of the causer, the causee and the infinitival complement expressing the effected predicate. As it appears, these constructions do not display any substantial semantic difference with the exception of the causative verb, which is *lætan* in (6) and *(ge)don* in (7).

(6) *Se mildheorta Drihten þe læt scinan his sunnan ofer þa*
The merciful Lord that lets shine his sun over the
rihtwisan & unrihtwisan gelice
righteous and unrighteous alike
‘The merciful Lord that makes his sun shine over the righteous and unrighteous alike’
(ÆCHom_I,_28:413.97.5526)

(7) *Se þe on heofonum is, se þe deþ his sunnan scinan ofer*
He who in heaven is, he who makes his sun shine over
þa yfelan & ofer þa godan

the evil and over the good

'He who is in heaven, he who makes his sun shine over good and evil'

(cocathom2,ÆCHom_II,_12.2:123.446.2695)

Interestingly, the same causative causation could be expressed by yet another construction, as shown in example (8), where we find *(ge)don* complemented by a *þæt*-clause. In this case there seems to be a difference with the previous constructions in that causation is only potential, as signalled by the presence of the verb *magan* 'may' that introduces the causative situation. Thus, it appears that the construction *(ge)don – þæt*-clause could be used when causation was only potential. This aligns well with the findings in Timofeeva (2010: 128), as she argues that the type of "causation implied by *(ge)don* is weak". In her work, Timofeeva (2010) uses weak to indicate that the causing and the caused event entertain a weaker degree of integration; this is reflected by the syntactic structure, as finite clauses introduced by *þæt* are considered to encode weak event-integration that bare infinitives, following the complementation scale proposed by Givón (2001: 43).

(8) *Gif ðu mage do þæt sunne scine þæt ðine æceras ripion*

If you may make that sun shine that your field ripe

'If you can make the sun shine so that your fields may ripen'

(cocathom2,ÆCHom_II,_7:62.78.1247)

The positions of most other individual constructions remain relatively stable across the two periods, indicating an overall stability in their functional profiles.

5 Reconstructing the Old English causative network

The aim of this article is to provide a comprehensive reconstruction of the Old English causative system by investigating (i) the types of causative situation encoded by *hatan*, *lætan* and *(ge)don*, (ii) how these verbs interacted with one another, and (iii) the extent to which the network changed during the Old English period. Section 6.1 deals with research question (i), while section 6.2 addresses (ii) and (iii).

5.1 The semantics of Old English causative verbs

The results of statistical analysis show that *hatan* as a causative verb was associated almost exclusively with animate causers and animate causees in the Old English period. These results point to a consistent pattern in the use of *hatan*, which can be explained by its semantic content. As Cloutier (2013: 25) observes, *hatan* could occur in a range of contexts: (i) with a direct object in calling constructions, (ii) with a direct object and a complement in naming constructions, (iii) with an infinitival complement in commanding constructions, and (iv) with clausal complements in commanding constructions. In all of these contexts, the semantic structure of *hatan* involves an animate subject who either calls, is named, or issues a command. It follows then that causative uses of *hatan*, which derive from the commanding construction, involve the presence of a causer that is always animate. Since *hatan* specifies that causing takes place by giving instructions that are to be followed, the causee is necessarily an animate entity as well. The interpretation of causative *hatan* is therefore typically coercive, as the causer compels the causee to act by exerting influence or authority.

An important feature of causative *hatan* constructions is that the presence of an animate causee is understood even when the causee is left unexpressed. Consider example (9). Here, the causee is implicit, but the action of breaking combined with the semantics of *hatan* indicate that the causee has to be an animate and agentive entity. In these cases, the causee is deleted because it is pragmatically predictable, recoverable from the surrounding context, or considered irrelevant in the whole causative situation.

(9) *Ða ne mihte Iudas metelas þær abidan, ac het abrecan*
Then not could Judas longer there wait, but commanded break
þone weall, þeah þe he brad wære. Eodon ða ealle inn,
the wall, although that he large was. Went then all inn,
ofslogon ealle ða hæðenan and aweston ða burh
killed all the heathens and destroyed the city
'Then Judas could no longer wait there, but made [someone] break the wall, although it was large. Then, they all went in, killed all the heathen and demolished the town'
(coaelive,ALS_[Maccabees]:447.5141)

As anticipated in Section 4.2, the occurrence with animate causers and causees indicates that *hatan* was used in contexts of inducive causation. It should be mentioned that the association with this type of causation holds throughout the Old English period, as *hatan* continued to cluster with animate causers and causees in both early and late Old English. Semantically, this indicates that *hatan* preserved its basic meaning and never grammaticalised further as a marker of causation expressing only the "pure notion of cause […] without more specific lexical content" (Kemmer and Verhagen 1994: 117). The presence of an animate causee in the semantic structure of causative *hatan* allows for a further characterisation. Specifically, the fact that the causee, and not the causer, is the most immediate source of energy in the caused event indicates that *hatan* marks indirect causation. That is, while it is the causer that initiates the entire causative situation by giving an order, it is an intermediary entity, i.e., the causee, that most directly brings about the effected predicate. Moreover, besides the presence of an intermediary party, causative *hatan* possesses all the three components that are typically associated with indirect causation, namely lack of unity of time and space (Hollmann 2003). Typological studies have argued that temporal and spatial distance between the causing and the caused event are characteristic of indirect causation (Fischer

1996, Givón 2001, Hollmann 2003). The absence of the causer from the caused event and the temporal distance between the causing event and the caused event invite us to conceptualise the causing event and the caused event as two independent and separate events, which is typical of indirect causative situation (Dixon 1991, Hollmann 2003). These components appear in causative *hatan* constructions. Look at example (10). The causer, *Hieu*, commands that the heads of the nobles are brought to him by an unspecified causee who carries out the event after the causer issues the order, thereby marking the absence of unity of time and space.

(10) *Þa het Hieu him to gebringan þara æðelinga heafdu ealle þæs*
Then commanded Hieu him to bring the nobles heads all the
on mergen. And he acwealde siððan ælc þing ðæs cynnes.
in morning. And he killed afterwards each thing that lineage.
'Then Hieu had all the heads of the divisions brought to him in the morning. And afterwards he killed all the people of that lineage.' (coaelive,ÆLS_[Book_of_Kings]:365.3929)

In causative *hatan* constructions, the causer is typically an entity viewed as superior to or in control of the causee, as the semantics of *hatan* construe the causer as having authority over the causee and the entire causative situation. In this regard, causative *hatan* resembles Present-Day English causative *have*. Talmy (1976: 107) describes causative *have* as portraying a situation in which the causer gives instructions that the causee has to carry out. Beyond the dynamics with which the causing event is brought about, the relationship between causer and causee is also similar to the one we observed with *hatan*. Duffley (1992: 71) notes that the causer is viewed as having the causee "in the bag", and Hollmann (2003: 68) conceptualises causative *have* within a 'sphere of control idealised cognitive model' (Lakoff 1987), where the causer is understood to be as superior to the causee. Lowrey (2013: 28) similarly observes that *hatan* – inf constructions could, and arguably should, be translated into Modern English using an implicative *have* – past participle construction.

Therefore, it is not surprising then that most occurrences of causative *hatan* appear in texts reporting historical events, such as the *Chronicles* and the works of Ælfric, in which kings or other authority figures issue commands (Royster 1918, Lowrey 2013). The *Martyrology* also features several causative *hatan* constructions, with pagan rulers as causers and usually unspecified causees tasked with executing saints (Timofeeva 2010a: 108). The peculiar contexts in which *hatan* is used could also explain its later demise. The rapid decline of causative *hatan* in early Middle English observed by Timofeeva (2010) and Lowrey (2013) may in fact not only reflect semantic competition with *lætan*, as it typically suggested, but also the disappearance of certain social conventions and social changes that took place in the transition between Old and Middle English (cf. Timofeeva 2010a).

The results of the statistical analysis concerning causative *(ge)don* empirically support the claim that it was mostly used in situations where the causer or the causee were inanimate entities and the effected predicate expressed a state (cf., Lowrey 2012) or was an unaccusative verb. The occurrence with inanimate causers and causees also indicates that the typical context of *(ge)don* was physical causation and this seems to be the prototypical use. Furthermore, these findings confirm the connection between *(ge)don* and inanimate causees identified by Lowrey (2012), although it has to be mentioned that *lætan* is also attested in combination with inanimate causees. It appears then that the prototypical causative context in which *(ge)don* was used is that of physical causation.

The basic meaning of *(ge)don* implies that the subject, be it animate or inanimate, initiates an event and exerts some kind of energy. What is important is that, unlike *hatan*, the semantics of *(ge)don* does not imply the presence of an intermediate party that intervenes between the initiator and the event: once the energy is put in, the effect is assumed to be inevitable. This semantic configuration characterises the uses of causative *(ge)don* as well, in which the most immediate source of energy is the causer, which inevitably brings about the caused event. The absence of another intermediate source of energy besides the causer means that *(ge)don* can be conceptualised as expressing direct causation. This is most clearly exemplified when *(ge)don* is complemented by a

þæt-clause, which is also the most frequent *(ge)don*-construction. In these cases, the causer brings about the caused event, which inevitably takes place, while the causee is the entity most directly affected by the effected predicate and has a more patient-like role. Differently from causative *hatan*, in which there is always a causee that is commanded to carry out a certain action, the causer of causative *(ge)don* constructions initiates a causative situation where there is no recipient or addressee to whom the command or permission is given, as the focus is on the achievement of a state of affairs. This use is clearly visible when *(ge)don* is complemented by a *þæt*-clause, but it does not change when the caused situation is realised by an infinitive. The fact that the statistical analysis strongly associates *(ge)don* with inanimate causees fits in well with this interpretation. The causee is often a patient-like entity, rather than an agent, which is typical of direct causative situations (cf. the analysis of Dutch causative *doen* 'do' in Verhagen and Kemmer 1997).

The results of the multiple correspondence analysis indicate that *lætan* could occur in a wide range of causative contexts and that there was a substantial degree of functional overlap with *(ge)don* and *hatan*. The relationship with *(ge)don* is characterised by cases in which the two causative verbs are largely interchangeable, as shown in examples (6)-(7) above. However, *lætan* and *(ge)don* also display a considerable difference in their semantic content. On the basis of its lexical features of and the type of causative situation it expresses, causative *(ge)don* has been characterised as expressing direct causation. Causative *lætan*, on the other hand, possesses a permission/enablement meaning that is part of the basic meaning of *lætan*, which entails the presence of an initiator that allows another entity to perform an action. Generally speaking, it is possible to describe the semantics of *lætan* as events in which the subject has the power to either permit or prevent the occurrence of a given action and, by not preventing it, permits the occurrence of an event (Verhagen and Kemmer 1997). The extension of these semantic features to causative uses means that the type of causation that *lætan* evokes is indirect, as the presence of another entity besides the causer that is the most immediate source of energy in the caused event is implied. In these constructions, the causer initiates the causative situation by allowing the occurrence of an

action in which the causee is the entity that carries out the caused event. These examples are particularly interesting because *hatan* was typically used in these contexts, particularly in early Old English. The type of causative situation *lætan* appears to express is coercive and, similarly to *hatan* with which it shares several similarities, may be rendered by causative *have* in Present-Day English. The development of *lætan* as a coercive causative verb is not typologically unparalleled. Kulikov (2001), for instance, argues that verbs of permission such as *lætan* typically develop into non-permissive, coercive causative verbs, as exemplified by the causative uses of *lassen* in German and *laten* in Dutch. Timofeeva (2011: 97) suggests that Old English *lætan* moves along the semantic path 'allow > let > make', with the more grammaticalised meaning 'make' that developed towards the end of the Old English. On the basis of the discussion carried out so far, it is perhaps more accurate to propose a development 'allow > let > make/have', with 'have' that serves to indicate this further development of *lætan* in late Old English. In this respect, *lætan* appears to acquire a more grammatical meaning in these examples and behaves as a more semantically neutral causative verb (cf. Timofeeva 2011).

As mentioned in Section 2.2, Verhagen and Kemmer (1997: 72) place the different causative contexts along a continuum that goes from more prototypically direct, which is the one expressing physical causation, to more prototypically indirect contexts such inducive and volitional contexts, while affective causation is not prototypically linked to direct or indirect causation. The same hierarchy is used by Hollmann (2005) to measure transitivity, with physical causation considered to be the least transitive, while inducive is the most transitive type. This scale can be used to characterise Old English causative verbs as well. At one end of the continuum, we can find *(ge)don*, which is typically used in physical causative contexts and more prototypically expresses direct causation. At the opposite end there is *hatan*, which is exclusively found in inducive causative contexts, is always transitive and typically conveys indirect causation. Somewhere in between there is *lætan*, which occurs in volitional and physical contexts and more prototypically expresses

indirect causation. Lastly, affective causation is encoded by *(ge)don*, although the results indicate that the correlation is not too strong.

5.2 Interactions and changes in the Old English causative network

Other characterisations that emerge from the statistical analysis concern the behaviour of the individual constructions and how their dynamics changed over time. We can interpret positions and distances in the maps reported in Figure 3 as relationships that the constructions entertain in the causative network. The main assumption is that constructions occurring close to one another share similar distributional profiles, while constructions positioned far away from one another have less features in common. The constructions involving *hatan* are quite close to one another in both early and late Old English, indicating that they occurred in similar contexts and that their profiles did not change during the Old English period. The frequency counts provided in section 5.1 show that infinitival constructions were the most frequent and, accordingly, we can assume that they were also the most entrenched ones, while finite complement constructions were relatively rare and thus their degree of entrenchment can be assumed to be lower. Turning to causative *(ge)don*, the fact that the construction *(ge)don – þæt* overlaps with the average profile of *(ge)don* in both early and late Old English indicates that it was the prototypical causative construction, as mentioned above. Furthermore, the position in the map suggests that *(ge)don – þæt* does not entertain a close relationship with any of the other constructions. Specifically, *lætan* – inf and *hatan* – (NP2) – *þæt* are the only constructions that occur in the same quadrant in early Old English, although they are rather far from *(ge)don – þæt*. In the late Old English period, *hatan* – (NP2) – *þæt* shifts closer to *(ge)don – þæt*, but it should be kept in mind that *hatan* with a *þæt*-clause was very infrequent altogether in Old English and that, consequently, its degree of entrenchment level was low. Infinitive constructions with *(ge)don* are infrequent across early and late Old English, suggesting that they were overall poorly entrenched. They are rather distant from *(ge)don* and are closer to *lætan*, suggesting that they entertained, particularly early on, a closer relationship with the latter.

The constructions involving *lætan* are the ones that have changed the most. In early Old English, the position of *lætan* – inf is close to *lætan* and is found in the same part of the plot that includes *hatan* and *(ge)don* complemented by a *þæt*-clause. In late Old English, the multiple correspondence analysis indicates that *lætan* – inf substantially shifts and moves closer to *hatan* – inf. The other construction involving *lætan*, i.e., *lætan* – NP2 – inf, does not show any significant change and continues to occupy a position relatively close to *lætan*.

Figures 4-5 capture these assumptions and propose a visual representation of the causative network in early and late Old English.[3] The position of the more concrete constructions at the bottom of the graphic representation stems from the results of the multiple correspondence analysis. They are linked horizontally as well as vertically to a more abstract schema V – (NP) – inf/*þæt*-clause, where X is filled by either *(ge)don*, *hatan*, and *lætan*. The vertical links connecting the more abstract constructional schemas to the more concrete constructions that they instantiate, as well as the horizontal links that relate the three causative verbs, are reported in grey.[4] The more abstract schema V – (NP) – inf/*þæt*-clause, which expresses a more general meaning 'X causes Y to do/undergo an action', licenses the entire causative network. The individual constructions are represented at different levels only to allow a better representation of their connections, but it should be kept in mind that the constructions entertain horizontal relations with one another, as they all are at the same level of abstraction. Dashed lines and boxes indicate low frequency and, accordingly, low entrenchment, while solid black lines and boxes are used for those constructions which occur more frequently in the dataset and are thus assumed to be more entrenched.

[3] Note that the graphic representations in Figure (4) and (5) are concerned exclusively with the causative network, but it can be assumed causative constructions are also horizontally connected to others which are either structurally or semantically similar – an instance of which are perception verbs constructions, which have the pattern NP – V – NP – inf (see Fischer 1989 on perception verbs).

[4] See the contributions in Smirnova and Sommerer (2020) on vertical and horizontal links.

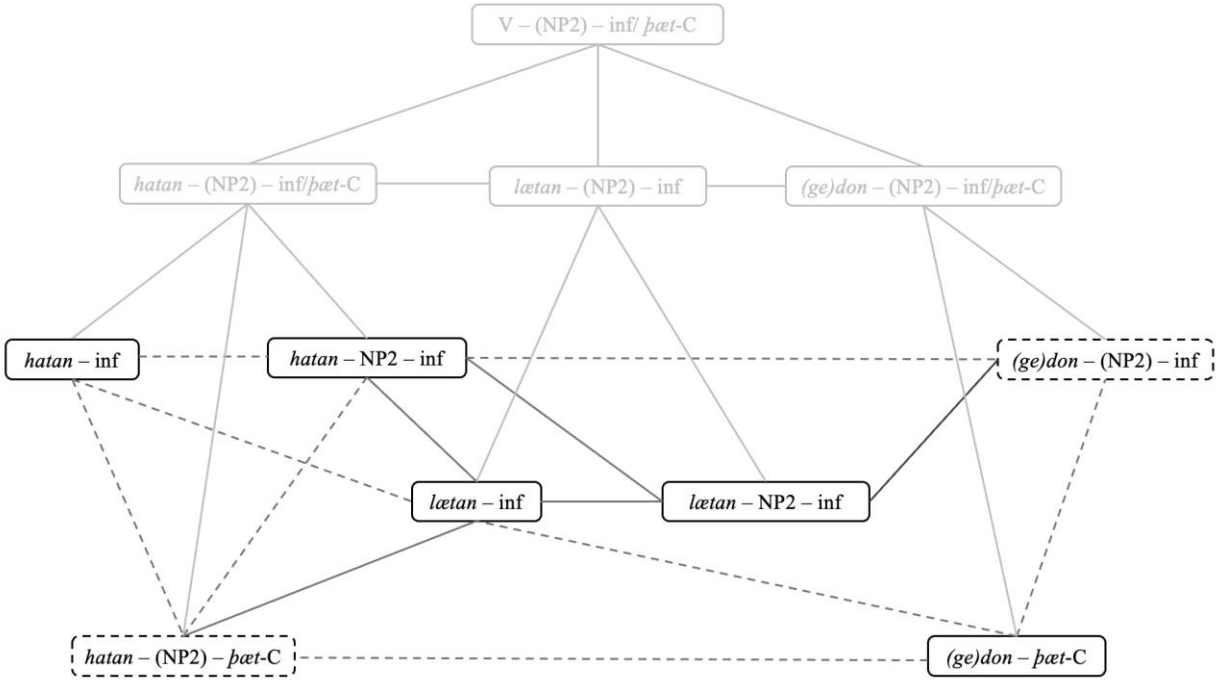


Figure 4: Network of causative constructions in early Old English (-950).

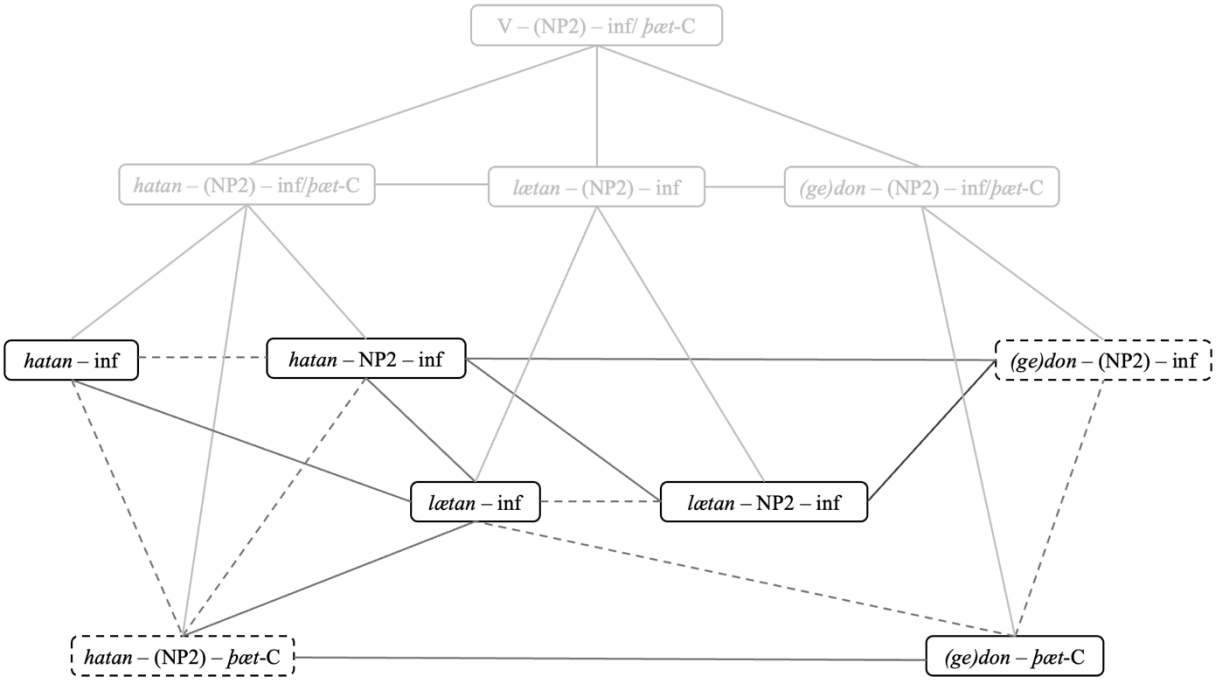


Figure 5: Network of causative constructions in late Old English (950-1150).

The low frequency of *(ge)don* constructions with infinitival complements raises the question as to whether their emergence is due to an internal development. Several studies have addressed this issue (e.g., Callaway 1913, Ellegård 1953, Fischer 1989, Timofeeva 2010a), particularly considering the role that this pattern has for the emergence of auxiliary *do* in Middle English (see Ellegård 1953, Denison 1985, AUTHOR 2021, AUTHOR et al. 2025 on the development of auxiliary *do*). The discussion mainly revolved around the role of Latin, as several occurrences of *(ge)don* with an infinitive verb complement are found in glosses and Latin translations (Timofeeva 2011). Early scholars proposed for a Latin origin (Callaway 1913, Ellegård 1953), while more recent accounts have foregrounded the hypothesis of an internal development, with Latin that possibly helped strengthening the establishment of the construction (Timofeeva 2011). An internal origin, indeed, seems to be the most favourable option for a variety of reason. Firstly, infinitival complements with *do*-verbs can be observed in old stages of several Germanic languages (e.g., German, Dutch, Frisian, Swedish, see van der Auwera and Genee 2002), which points at a broader Germanic development. Secondly, the scarce knowledge of Latin among the population in Old English makes it complicated for Latin to have directly influenced Old English syntax, as discussed in Section 2.1. Thirdly, and most importantly, an alternative hypothesis whereby the emergence of *(ge)don* – NP2 – inf can be modelled in terms of analogical extension of causative *(ge)don* to a new syntactic context is possible. The position of *(ge)don* – (NP2) – inf computed by the statistical model suggests that Old English speakers extended the range of syntactic contexts in which causative *(ge)don* could occur and began to use it with infinitival complements on the basis of other, structurally similar causative constructions with the pattern V – (NP2) – inf (e.g., *lætan* – (NP2) – inf, *hatan* – (NP2) – inf). In addition, there also existed other constructions with the pattern V – (NP2) – inf, as for instance the members of the so-called perception verb class such as *(ge)hieran* ‘to hear’, *(ge)seon* ‘to see’, which contributed to the type frequency of the pattern V – (NP2) – inf. There is ample evidence in the usage-based literature that high type frequency is positively correlated with productivity, which means that the higher the type frequency of a given

pattern is, the higher the likelihood that such pattern will attract new members (Baayen 1993, Bybee 2007, Barðdal 2008, De Smet 2020). In the case of *(ge)don* – (NP2) – inf construction, the large number of verb types, be they causative or not, that could occupy the V slot in the V – (NP2) – inf pattern favoured the chance to extend the range of uses of causative *(ge)don*. The way in which these constructions helped the development of causative *(ge)don* – (NP2) – inf is by fully or partially sanctioning it (see Langacker 1987: 68-71 on the notions of full and partial sanction). When language users either produce or encounter a novel linguistic structure, they process it by analogically relating it to other structures that already exist in their linguistic networks (Jackendoff and Audring 2020). These new constructions are sanctioned, i.e., judged as grammatical or acceptable, by established structures to the extent that there is no conflict between them. In the present case, causative *(ge)don* – (NP2) – inf was analysed as acceptable on the basis of the similarities between other causative constructions complemented by an infinitive verb and other constructions exhibiting the same V – (NP2) – inf pattern.

The hypothesised scenario concerning the emergence of *(ge)don* – (NP2) – inf is given in Figure 6. The causative constructions *(ge)don* – *þæt*, *lætan* – (NP2) – inf and *hatan* – (NP2) – inf, which directly contributed to the development, are connected to *(ge)don* – (NP2) – inf by means of a solid line. Other constructions sharing the pattern V – (NP2) – inf that played a role in the type frequency of the pattern are indicated with the symbol '…' and are linked to *(ge)don* – (NP2) – inf via a broken line, as it is suggested that they only indirectly supported its emergence.

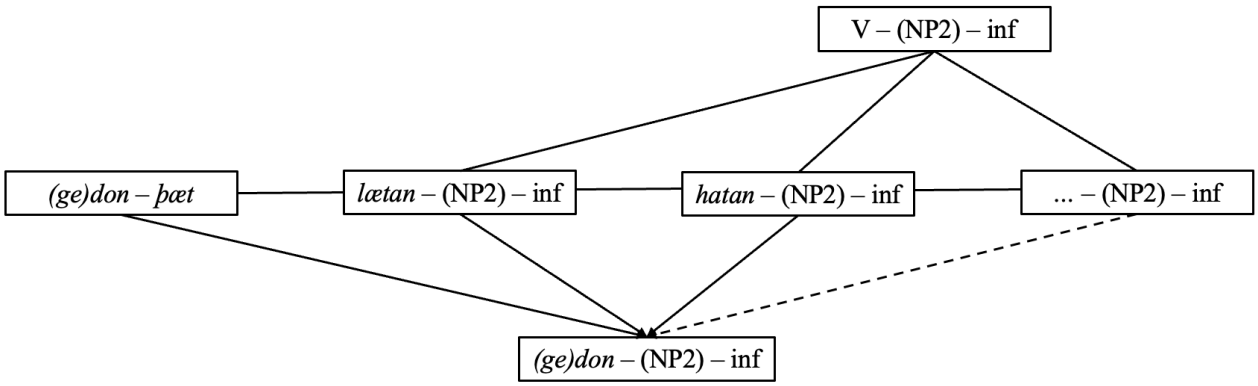


Figure 6: Proposed reconstruction of the emergence of causative *(ge)don* – (NP2) – inf.

6 Conclusion

This paper set out to reconstruct the Old English periphrastic causative constructions focusing on *(ge)don*, *lætan* and *hatan*. Unlike previous contributions, this study used a large dataset that was analysed by means of a multiple correspondence analysis. The focus of this study revolved around (i) determining the type of causative situation encode by *(ge)don*, *lætan* and *hatan*, (ii) the way in which they interacted with one another and (iii) the extent to which the causative system changed throughout the Old English period. The results of the statistical analysis regarding (i) indicate that there were substantial differences in the type of causation expressed by *(ge)don, lætan* and *hatan*, with the first being associated with physical and affective causation, the second with volitional and physical contexts, and the third with inducive causation. It has also been discussed that these verbs can be further differentiated with respect to directness, since *(ge)don* typically expresses direct causation, while *lætan* and *hatan* convey indirect causation. With regards to (ii), the multiple correspondence analysis has shown that there existed some degree of overlap in the distributional profiles of *(ge)don*, *lætan* and *hatan*, particularly between *(ge)don* and *lætan* in early Old English and *lætan* and *hatan* in the late period. The results concerning the last research question reveal that the position of some constructions change throughout the Old English period, with connections that grew stronger (e.g., between *lætan* – inf and *hatan* – inf), while others became weaker (e.g., *lætan* – NP2 – inf and *lætan* – inf). In addition, it was discussed how the construction formed by *(ge)don* and infinitival complement developed on the basis of the indications provided by the quantitative analysis.

On a broader level, this paper has shown that investigating closely related constructions like causative verbs as dynamic, multi-relational networks can help us get a better understanding of their synchronic features as well as their diachronic developments. Complex quantitative models like the one used in this study that are designed to include a variety of semantic and syntactic properties prove to be more insightful than previous accounts which almost exclusively focused on syntax and

did not rely on corpus-based evidence. Nevertheless, the present study presents some limitations. Firstly, this study did not consider the influence of text type on the distribution of the difference causative verbs, as it has been suggested that some constructions, particularly *lætan* – NP2 – inf, occur in specific texts (cf. Timofeeva 2010a: 95). Secondly, the analysis presented here did not consider other, more marginal causatives, but focused only on the most frequent ones. While it is unlikely that they would change the reconstruction presented in this paper, it would be worth investigating the way they interacted with more frequent causative verbs and the positions they occupied in the causative network.

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