

Rule independence and rule conditioning:
Grammar competition in Old English relative clauses

Richard Zimmermann

Grammar competition usually involves structured variation with two variants. However, it is also possible that two competing rules do not involve the same initial node in a syntactic tree, but merely make a similar functional contribution. For such cases, it is possible to find diachronic variation with three variants - two for each separate rule and one for the two rules combined. It is argued that a necessary condition for the existence of overlapping forms is rule independence, i.e. the absence of conditioning factors. Old English relative clauses are analysed as an instance of grammar competition with three variants to substantiate this claim.

1. Introduction

Syntactic change is characterised by an innovative form α driving out a conservative form β . During a transitional period, both α and β co-occur but gradually shift their relative frequencies following an s-shaped curve (e.g. the change in IP headedness (Pintzuk 1999) or the loss of V-to-I movement (Ellegård 1953) in the history of English among many others). This observation can fruitfully be modelled under a competence-based approach known as “grammar competition” – two competing grammatical rules coexist within a single I-language and generate the observed structured variation between α and β (Kroch 1989, 1994).

It is possible, albeit seemingly rare, that the two competing rules do not involve the same initial node but are introduced in two distinct positions in the syntactic structure. In such a case, competition does not arise from strict mutual exclusivity, but rather from the fact that the two rules make a similar functional contribution. One would then expect diachronic variation with three instead of two variants: one for the rule generating α , one for the rule generating β , and one for the case of the two rules being applied simultaneously, generating an **overlapping form**, $\alpha \cap \beta$.

Old English (OE) relative clauses are a case in point: they can be generated by a rule that places a form of the demonstrative *se* in Spec,CP (1), or by a competing rule that merges the indeclinable relativiser *þe* with a tensed clause (2). Since the starting nodes of the two rules are different (CP and C' respectively), the overlapping form, a doubly filled COMP clause, can be generated as well (3).

- (1) *ðonne cymeð [se man [se þæt swiftoste hors hafað]] to þæm ærestan dæle*
 then came the man who the fastest horse had to the first valley
 ‘Then the man who had the fastest horse came to the first valley.’
 (coorosiu,Or_1:1.17.21.333)
- (2) ... gold-horde on þam æcereþone behyt [se man [þe hyne fint]]
 ... treasure in the field which hides the man that it finds
 ‘... a treasure in the field, which the man that finds it, hides’
 (cowsgosp,Mt_[WSCp]:13.44.890)
- (3) Eadig bið [se man [se ðe¹ gemet wisdom]]
 blessed is the men who that meets wisdom
 ‘Blessed is the man who finds wisdom.’
 (coaelive,ÆLS[Pr_Moses]:322.3053)

It is not my aim in this paper to model the structures involved, but rather to give a clear overview of the empirical facts and to offer an account for these in terms of grammar competition. I will suggest that overlapping forms are generally possible if the two base rules generating them are independent but absent if they are conditioned, and apply this analysis to OE relative clauses. First, I will explain the concepts of rule independence and rule conditioning. Next, I will demonstrate that *se*- and *þe*-relatives are in grammar competition in OE and determine factors influencing their occurrence. These observations will lead to specific predictions regarding the distribution of the overlapping *seþe*-form, which will be tested in the subsequent section. The conclusion follows.

2. Rule independence and rule conditioning

A rule is said to be independent if its range of application is not restricted by a conditioning factor.² Conversely, a rule is conditioned if it can only be applied in a restricted context. Clear-cut examples of this dichotomy can be found in (historical) phonology. For example, West-Saxon monophthongization of Proto-Germanic *[ai] (c. 400 A.D.) invariably affects all occurrences of that phoneme (Campell 1959: §132). In contrast, Old English palatalization of Proto-Germanic *[k] (c. 500 A.D.) is restricted by the phonological context – it takes place only if immediately followed by /i/, /i:/ or /j/ (Hogg 1979, Campell 1959: §426).³ Similarly, syntactic rules can be independent or conditioned. However, conditioning factors restricting

¹ *þ* (‘thorn’) and *ð* (‘eth’) are freely exchangeable graphemes in Old English. Thus, the indeclinable relativiser can be spelled both *þe* as well as *ðe*.

² I use “rule” in a deliberately vague way. Depending on one’s theoretical leanings, “rules” may be formalized as (constrained) phrase structure rules, syntactic transformations, feature strength, etc.

³ Illustrative examples of the operation of these rules are as follows:

- (i) independent sound change: Proto-Germanic *[ai] → West-Saxon [a:]
 a. Proto-Germanic **stainaz* → West-Saxon *stān* ‘stone’
 b. Proto-Germanic **aiks* → West-Saxon *āc* ‘oak’
- (ii) conditioned sound change: Proto-Germanic *[k] → Old English [tʃ] / _ [+palatal]
 a. Proto-Germanic **kildiz* → West-Saxon *cild* [tʃild] ‘child’
 vs. Proto-Germanic **kaldaz* → Anglian *cald* [kald] ‘cold’
 b. Proto-Germanic **sprēkijō* → Old English *spæc* [spæ:tʃ] ‘speech’
 vs. Proto-Germanic **sprekanan* → Old English *spekan* [spekan] ‘speak’

the application of rules in syntax appear to be considerably more “unwieldy”: they often occur with exceptions, are frequently “soft” or probabilistic rather than absolute (Hawkins 1994), and are thus difficult to describe and to formalize comprehensively. A syntactic rule can be conditioned by a mere grammatical feature, particular semantic characteristics of a set of relevant lexical items, import from information structure, or phonological factors such as heaviness, among others. For instance, the rule that combines the lexical verb with its complement in Modern English uniformly generates head-initial structures; object-verb orders are categorically ungrammatical. This rule is thus independent. In contrast, subject-auxiliary inversion in Modern English declarative clauses occurs after certain fronted negative or restrictive constituents (e.g. *no sooner*, *only at night*, *rarely*), but is absent otherwise. Similarly, indirect, pronominal, animate objects in Modern French are postverbal if a “verb of thinking” is involved (*je pense à lui*, not **je lui pense* ‘I think of him’), but are regular proclitics on the finite verb elsewhere (*je lui parle*, not **je parle à lui* ‘I speak to him’) etc. These are therefore examples of conditioned rules.

If two competing rules of a syntactic change, α and β , are independent, their application will be independent in a statistical sense as well (abstracting away from priming effects). That means that their application will simply depend on the weights of the respective rules (Yang 2002: 129-134) (or the weight of some constraint of an evaluative component of the grammar, like Optimality Theory (e.g. Clark 2004)). As a consequence, rules α and β will also allow an overlapping form provided that their starting nodes are different. The probability of its occurrence should be equal to the product of the individual weights of α and β . Under this view, overlapping forms are “accidental”; they occur when both rules are independently applied simultaneously.

(4) Frequency prediction for an overlapping form based on independent rules α , β :

$$P(\alpha \cap \beta) = P(\alpha) \cdot P(\beta)$$

If, on the other hand, two rules α and β with different starting nodes have mutually exclusive conditions, they should not allow an overlapping form. The reason is that conditioned rules do not share a common context in which simultaneous application of both rules would be possible to begin with.

(5) Frequency prediction for an overlapping form based on conditioned rules α , β :

$$P(\alpha \cap \beta) = P(\alpha|A) \cdot P(\beta|A) = 0$$

$$(\text{if } P(\alpha|A) + P(\beta|A) = 1, \text{ and either } P(\alpha|A) \text{ or } P(\beta|A) = 0)$$

One well-studied example of an overlapping form created by two independent rules is Jespersen’s (1917) cycle of negation in the history of English. In Middle English, sentential negation can be encoded by cliticizing the negative particle *ne* to the finite verb, or by merging the negative adverb *not*, or by doing both. The two formal devices can be employed in exactly identical contexts, i.e. they are independent. Thus, the *ne*- and *not*-rules compete until eventually the particle *ne* is lost. The frequency prediction for the overlapping form *ne ... not* (cf. (4)) has been tested and confirmed for this change (Frisch 1997, Wallage 2007).

Time Period	# Negative Clauses	<i>ne</i>	<i>not</i>	Expected <i>ne...not</i>	Observed <i>ne...not</i>
1150-1220	235	232 (99%)	85 (36%)	84 (36%)	82 (35%)
1220-1290	184	179 (97%)	72 (39%)	70 (38%)	67 (36%)
1290-1360	421	377 (90%)	235 (56%)	210 (50%)	191 (45%)
1360-1430	746	139 (19%)	717 (96%)	134 (18%)	110 (15%)
1430-1500	343	2 (1%)	341 (99%)	2 (1%)	0 (0%)

Table 1: Frequency of Middle English negation through the negative clitic *ne*, the adverb *not*, and their overlapping form, in declarative clauses (based on Frisch 1997:32, Table 1)

As shown in Table 1, the frequency of the overlapping form *ne ... not* can be estimated with astonishing accuracy as the product of the observed relative frequencies of *ne* and *not* alone.

An example of the absence of an overlapping form under rule conditioning is provided by Middle English relative clauses. The functional item *that* became a generalized relativiser in early Middle English (Suárez 2012) so that “in the thirteenth century *that* stood practically alone as a relativiser. It was used in restrictive as well as non-restrictive clauses, with animate as well as inanimate antecedents.” (Fischer et al. 2001: 91). Subsequently, new *wh*-elements are introduced into the language as relative operators, perhaps as an extension from generalising free relatives (6), which exist unvaryingly throughout early English.

- (6) & þa þider urnonswa hwelc swa þonne gearo wearþ
 And then thither ran so which so then ready was
 ‘and they then ran there, whoever was then ready’
 (cochronA-CC, ChronA_[Plummer]:755.16.524) (c. 900 A.D.)

Crucially, from the earliest period on, Middle English *wh*-relatives (predominantly *which* and *whom*) were largely non-restrictive. I examined a sample of 200 Middle English *which*-relatives, and found that more than 80% of them were non-restrictive. Conversely, as Romaine (1984: 102) points out, *that* begins to be limited to restrictive clauses as soon as *wh*-pronouns adopt a relative function. In a more recent study, Diertani (2008) examines Middle English relativization strategies as a function of antecedent type – bare quantifier antecedents favour a restrictive reading of the relative clause, whereas proper names favour a non-restrictive reading – and finds that *wh*-pronouns are never found with any appreciable frequency in the former context while the frequency of *that* in the latter context consistently declines. If the application of the *wh*- and *that*-rules are indeed strongly conditioned by restrictiveness, the prediction following from (5) would be that the overlapping “*wh that*” form is absent from the language. In order to test this prediction, I collected Middle English relative clauses in which the relativized element is the subject or an object from Kroch & Taylor (2000) and sorted them by relativization strategy.

Time Period	# Relative Clauses	<i>that</i>	<i>wh</i>	Expected <i>wh that</i>	Observed <i>wh that</i>
1150-1250	951	948 (100%)	3 (0%)	3 (0%)	0 (0%)
1250-1350	1998	1931 (97%)	78 (4%)	75 (4%)	11 (1%)
1350-1420	4211	3979 (94%)	270 (6%)	255 (6%)	38 (1%)
1420-1500	2109	1447 (69%)	668 (32%)	458 (22%)	6 (0%)

Table 2: Frequency of Middle English relativization through *that*, *wh*-elements, and their overlapping form

Table 2 shows that, as expected, the overlapping form is extremely infrequent and cannot be estimated based on the relative frequencies of *that*- and *wh*-relatives alone. Claims to the effect that Middle English freely allows doubly filled COMP relatives in the fourteenth and fifteenth century (e.g. Keyser 1975) are not true; such clauses exist only very sporadically (7) and only in the early periods, perhaps before rule conditioning became absolute.

- (7) the person of Syn Stevynnys in Walbroke, *whyche that* was one of the same fore sayde traytours, deyde in the Toure for sorowe.
 ‘The parson of St Stephen's in Walbrook, who was one of the aforementioned traitors, died in the Tower out of sorrow.’
 (CMGREGOR,184.1301) (c. 1450 A.D.)

In summary, overlapping forms are expected to occur if the individual rules are not restricted by conditioning factors while they are absent if the individual rules are applicable only in mutually exclusive contexts.

3. Grammar competition and rule conditioning in Old English relative clauses

I will now turn to the analysis of OE relative clauses. It will first be argued that the OE *se*- and *þe*-relativization rules compete with each other. Subsequently, I will identify conditioning factors on the occurrence of *se*- and *þe*-relatives, from which I will derive a frequency prediction for the overlapping *seþe*-form.

3.1. Grammar Competition between *se* and *þe*

In this section, I will present evidence for the claim that the two principal OE relativizing forms, *se* and *þe*, are in grammar competition. Firstly, I measured, as the dependent variable, the occurrence of *se* and *þe* relativization as a function of time/period in three different genres: prose texts, documents, and poetry. The frequencies of *se*- and *þe*-relatives were measured as a percentage of all relative clauses, including relativization with zero operators, *that*, possessive determiners (the equivalent of Modern English *the boy whose sister I like*), adverbial relatives (the equivalent of Modern English *the reason why he came, the time when you slept*, etc.) and others. The data for the first two genres were collected from Taylor et al.

(2003), while the data for the poetry came from Pintzuk & Plug (2001) and various early Middle English poems.⁴ The results are presented in Table 3.

Genre	Time Period	# Relative Clauses	<i>se</i>	<i>þe</i>
prose	9th c.	10033	1953 (19%)	4075 (41%)
	10th c.	4798	523 (11%)	2614 (54%)
	11th c.	12856	1172 (9%)	7336 (57%)
documents	to 950	88	11 (13%)	49 (56%)
	after 950	162	11 (7%)	112 (69%)
poetry	Old English	1274	200 (16%)	341 (27%)
	Middle English	260	7 (3%)	102 (39%)

Table 3: Frequencies of *se* and *þe*-relatives as a percentage of all relative clauses

The frequency of *se*-relatives falls consistently across all three genres. The decline is therefore not just a genre-specific effect. Furthermore, the frequency of *þe*-relatives increases consistently. This finding suggests that *se*-relatives drop out of the language specifically at the expense of *þe*-relatives and not because of some other relativization strategy.

Secondly, it is a hallmark of grammar competition that a change may be actuated sequentially in different linguistic contexts, but that the rate of replacement of one grammatical rule by another will subsequently be identical in all of them. In other words, the graphs for different linguistic environments plotting the frequencies of an innovative against a conservative form will show identical slopes but may show different intercepts. This postulate is known as the **Constant Rate Hypothesis** (Kroch 1989). If the rules generating *se*- and *þe*-relativization are indeed in a state of grammar competition, one would thus expect constant rate effects. One way of testing the constant rate hypothesis involves comparing factor weights from variable rules analyses: “if a study reports a series of multivariate analyses for different time periods, and the contextual effects are constant across these analyses, the rate of change of each context measured separately would necessarily be the same” (ibid.: 206).

Therefore, I used the data collected for the variable rules analysis to identify conditioning factors in Old English relatives (see below) and compared the factor weights for the factor group ‘clause type’ separately for the three time periods ‘9th century’, ‘10th century’ and ‘11th century’. There were three variants for this factor group: main clauses, conjoined main clauses and subordinate clauses. This three-way distinction has become standard practice in OE syntax as it is known to be a relevant predictor of the frequency of various constructions such as V-to-C movement or I-final headedness (e.g. Kemenade 1987, Traugott 1992). The results of this investigation are presented below.

⁴ *Body and Soul* (Buchholz 1890 : 1-10), *The Grave* (Buchholz 1890: 11), *Poema Morale* (Morris 1873 : 220-32), *The First Worcester Fragment* (Brehe 1990: 530), *Pater Noster* (Morris 1868: 55-71), *A Good Orison of Our Lady* (Morris 1868: 191-99).

Time Period	Clause Type	% <i>se</i> -relatives	Total	Factor Weight
9 th century	main	38.9	1925	0.54
	conjoined main	29.9	1110	0.48
	subordinate	29.7	2639	0.48
10 th century	main	17.8	1223	0.53
	conjoined main	16.8	642	0.52
	subordinate	15.4	1033	0.46
11 th century	main	15.5	3401	0.55
	conjoined main	12.5	1953	0.49
	subordinate	11.1	2593	0.45

Table 4: Effect of clause type on the distribution of *se*- (vs. *þe*-) relatives in three OE periods

Table 4 reveals a weak clause type effect. Main clauses show the highest probability of the occurrence of *se*-relative clauses, subordinate clauses are least likely to do so and conjoined main clauses pattern in between. As expected, the effect of this contextual factor is relatively constant across the three periods (range of main clauses: 2; range of conjoined main clauses: 4; range of subordinate clauses: 3). Put differently, the development of the overall rate of use of *se*- vs. *þe*-relatives is independent of the contextual effect induced by ‘clause type’ on its use. This finding supports the constant rate hypothesis and thus the assumption that the underlying OE *se*- and *þe*- relativization rules compete.

3.2. Rule conditioning on *se* and *þe* relativization

I will now test whether the two basic relativization rules, generating *se*- and *þe*-relatives respectively, are applied independently or are subject to conditioning factors. As explained earlier, such an investigation is necessary in order to be then in a position to make predictions regarding the relative frequency of the overlapping form in OE relative clauses.

3.2.1. Multivariate analysis

Methodology

I carried out a variable rules analysis with VARBRUL (GoldVarb, Robinson et al. 2001), investigating the occurrence of *se* vs. *þe*-relatives as the variants of the dependent variable and (a) ‘antecedent type’, (b) ‘clause type’, (c) ‘position of the relative clause’ and (d) ‘period’ as independent variables (factor groups). The first independent variable had fifteen variants: ‘bare proper names’, ‘complex proper names’, ‘bare negative quantifiers’, ‘complex negatively quantified DPs’, ‘bare universal quantifiers’, ‘complex universally quantified DPs’, ‘bare existential quantifiers’, ‘complex existentially quantified DPs’, ‘DPs containing a superlative’, ‘DPs containing a possessive’, ‘bare determiner’, ‘complex DPs’, ‘bare personal pronouns’, ‘other DPs with a nominal’, and ‘other’. These categories were defined to be mutually exclusive. If an antecedent contained material to be appropriate for more than one category, it was included only in the category mentioned earlier in the above list. The second factor group had three variants: main clauses, conjoined main clauses and subordinate clauses. The third variable was coded either as ‘in situ’ if the relative clause immediately followed the antecedent or as ‘extraposed’ if material intervened between antecedent and relative clause. Finally, the factor group ‘period’ included the variants ‘9th century’, ‘10th century’ and ‘11th century’ depending on the date of composition of the relevant texts.

The material was collected from Taylor et al. (2003) and automatically coded using the coding function of CorpuSearch 2 (Randell 2004). On account of certain technological limitations, only the first relative clause per token could be coded. This means that multiple relative clauses modifying a single or different antecedents as well as conjoined relative clauses could not be included. All in all, 16,519 tokens were analysed. The results of this study are shown in Table 5 below.

Total N=16,519		Corrected Mean: 0.156	
	Factor Weight	% SE-relatives	N
Antecedent			
bare universal	0.936	70.3	313
complex name	0.864	55.1	405
complex existential	0.863	57.9	594
bare nominal	0.813	46.6	654
bare name	0.789	44.3	476
possessive	0.722	35.4	1267
other	0.718	33.1	904
bare existential	0.698	31.6	38
superlative	0.674	28.9	90
bare pronoun	0.505	17.6	301
complex negative	0.445	15.8	133
bare determiner	0.408	13.2	4012
bare negative	0.379	12.5	24
complex DP	0.342	9.9	6057
complex universal	0.324	8.6	1251
<i>Range</i>		61	
Clause Type			
main	0.540	22.8	6549
conjoined main	0.487	18.2	3705
subordinate	0.466	19.7	6265
<i>Range</i>		7	
Position			
in situ	0.463	17.5	12666
extraposed	0.619	30.7	3853
<i>Range</i>		16	
Period			
9th c.	0.695	32.7	5674
10th c.	0.458	16.7	2898
11th c.	0.371	13.4	7947
<i>Range</i>		33	

Table 5: Factors significant to the occurrence of *se*-relatives in OE

Evaluation

The applied dependent variable in Table 5 is *se*-relatives. For all variants, a factor weight larger than 0.5 indicates a preference for *se*-relatives, and, conversely, a value smaller than 0.5 indicates that *se*-relatives are disfavoured. The low corrected mean of 0.156 indicates that *se*-relatives are dispreferred overall. All independent variables turned out to be significant.

Restrictiveness

Se-relatives are significantly more likely to occur with antecedents containing elements such as proper names, or existential quantifiers, than with antecedents containing, for example, determiners or universal quantifiers. This finding can plausibly be accounted for by the assumption that *se*-relatives are favoured in non-restrictive contexts while *þe*-relatives tend to occur in restrictive relative clauses.

Proper name antecedents pick out a unique individual and thus are not usually restricted further by a relative clause (8a). Similarly, relative clauses modifying existentially quantified DPs (8b) or DPs without any overt quantifier or determiner (8c) are more likely to receive a non-restrictive than restrictive interpretations in the surviving OE text material. The OE existential quantifier tends to restrict the potential referents of the antecedent sufficiently (similar to Modern English ‘a certain X’) and bare nominals tend to be introduced as discourse new elements, which do not typically occur with relative clauses restricting their reference further (similar to Modern English indefinite DPs). The preference for the *se*-form in these contexts can thus plausibly be explained in terms of non-restrictiveness of the relative clause.

(8) a. complex name

on þyses cinges dagum *Laurentius ercebiscop* se was on Cent æfter Augustine
 in this king’s days Laurentius archbishop who was in Kent after Augustine
 forþferde iiii Nonae Februarii
 died four Nones February

‘In this king’s days, Archbishop Laurentius, who was [archbishop] in Kent after Augustine, died on the second of February.’

(cochronA-8,ChronA_[Plummer]:616.8.287) (c. 1100 A.D.)

b. complex existential (existentially quantified DP)

he ongan onbærnan *sum deofolgild* þæt⁵ mid þam hæðenum mannum
 he began burn some devil-offering which among the heathen men
 swiðeweorð & mære wæs.
 very worthy and great was.

‘He began to burn a certain idol, which was very valuable and great to the heathens.’

(coverhom,LS_17.2_[MartinVerc_18]:155.2319) (c. 970 A.D.)

⁵ Here, *þæt* is accusative, neuter, singular of *se*.

c. bare nominal (DPs without any overt quantifier or determiner)

& he þer gehadode *godne* *wer* se wes mid ciriclicum þeodscipum geseted
 and he there ordained good man who was with churchly people set
 ‘and there he ordained a good man, who was given an ecclesiastical community’
 (cohad,LS_3_[Chad]:31.22) (c. 850 A.D.)

In contrast, in naturally occurring language data, relative clauses tend to receive a restrictive rather than a non-restrictive reading if they modify definite DPs (9a), bare determiners (9b), universally quantified DPs (9c) or other antecedents that are unlikely to pick out unique referents and thus easily occur with further restrictive modification (e.g. negative quantifiers, pronouns, etc.). The fact that these antecedents tend to occur with *þe*-relatives can thus be reduced to restrictiveness of the relative clause as the underlying conditioning factor.

(9) a. complex determiner (complex expression involving a determiner)

Se apostol Paulus manode *ða* *cristenan* þe he sylf ær to geleafan
 The apostle Paul admonished the Christians who he self earlier to faith
 gebigde
 converted
 ‘The apostle Paul admonished those Christians who he had himself earlier converted.’
 (coaelive,ÆLS_[Auguries]:1.3532) (c. 1000 A.D.)

b. bare determiner

se þe wunaþ on ðære soðanlufan, he wunað on Gode
 that(one) who lives in the true faith, he lives in God
 ‘He who lives in the true faith lives in God.’
 (coverhom,HomS_11.2_[ScraggVerc_3]:9.393) (c. 970 A.D.)

c. complex universal (universally quantified DP)

Ac *ælc* *mon* þe allunga underþeoded bið unþeawum forlæt his sceppend
 But each man who entirely subdued is vices lets his creator
 ‘But each man who is entirely subdued by vices loses his creator.’
 (coboeth,Bo:30.69.30.1296) (c. 900 A.D.)

Antecedents with bare universal quantifiers are a striking exception to the tendency that *se* occurs in non-restrictive and *þe* in restrictive relative clauses. They are modified more naturally by restrictive relative clauses than by non-restrictive ones (cf. *everything that I know*, *#everything, which I know*). Nevertheless, bare universal quantifiers are much more likely to occur with *se*- than with *þe*-relatives (10).⁶

⁶ A similar phenomenon can be observed in Modern German, where the standard relativiser is the definite article but relative clauses modifying the bare universal quantifier *all* are introduced by *what* (*alles was ich habe* ‘everything that I have’, **alles, das ich habe*).

- (10) Ðæt hwæðre æðelice ongetan meah tonealle þa⁷ þæt cuðon
 that however easily understand could all who that knew
 ‘However, everybody who knew it could easily understand that.’
 (cobede, Bede_4:26.348.29.3518) (c. 890 A.D.)

There is in fact some scholarly consensus that restrictiveness is a conditioning factor on OE relative clauses. Andrew (1940), Mitchell (1985: §§2252-2287) and Troup (2010) are just a few scholars who have extensively commented on the function of relative clauses and their effect on the realization of the relativizer. They all agree that *þe* tends to introduce restrictive and *se* non-restrictive relative clauses.

The hypothesis that *se*- and *þe*-relativization correlate with restrictiveness is further supported by an interaction effect between restrictiveness and negation. Non-restrictive relative clauses must lie outside the scope of sentential negation and are therefore ungrammatical if they modify an antecedent that occurs in a negative clause (at least in realis contexts, e.g. Arnold 2004).

- (11) a. I have a car. It is red.
 b. I have a car, which is red.
 c. #I don't have a car. It is red.
 d. *I don't have a car, which is red.

If *se*-relatives favour non-restrictive relative clauses, one would expect that this relativizing strategy is dispreferred in negative context. This expectation is borne out, as shown in Table 6.

	<i>se</i>	<i>þe</i>
positive context	1930	6671
negative context	22	438

Chi-square=80.54, df=1, p<0.0001

Table 6: Distribution of *se* and *þe* relatives (in situ) modifying antecedents in tokens with and without sentential negation

Other factors

Another contextual factor that has an effect on the relativization strategy in OE is ‘position of the relative clause.’ *Se* is more likely to occur if the relative clause is extraposed than if it is in situ. This factor, too, has been identified and commented on before (e.g. Mitchell 1985: §§2288-2303, Suárez 2006).

Perhaps surprisingly, ‘clause type’ was also identified as a significant factor by the VARBRUL program. Main, conjoined main and subordinate clauses form a hierarchy such that *se*-relatives are more likely in the former than in the latter (see above). However, all in all, this is a very weak effect.

Finally, as expected, ‘period’ has a significant effect on the occurrence of *se*- vs. *þe*-relatives. As time progresses, *se*-relatives become increasingly less productive.

⁷ Here, *þa* is nominative, plural of *se*.

3.2.2. Rule Conditioning

I assume that the different linguistic contexts thus identified, restrictiveness in particular, were much more rigid conditioning factors at some earlier stage of the Old English language. Subsequently, they began to weaken; *þe*-relatives gradually encroached upon linguistic contexts originally limited to *se*-relatives, and by the time of transmitted Old English, the formerly rigid conditions had become mere tendencies (Mitchell 1985: §2283). If this is true, the weakening of linguistic conditions should be measurable with the same methodology used earlier to show that the effect of the factor ‘clause type’ is constant across the three OE periods (see above). In contrast to the earlier investigation, however, the factor weights for ‘antecedent’ and ‘position’ should gradually shift towards 0.5, i.e. the value for which *se*-relatives are neither favoured nor disfavoured. Table 7 presents the relevant data for the factor group ‘position.’

Time Period	Position	% <i>se</i> -relatives	Total	Factor Weight
9 th century	in situ	27.9	4183	0.45
	extraposed	46.2	1491	0.64
10 th century	in situ	14.4	2277	0.47
	extraposed	25.3	621	0.63
11 th century	in situ	11.7	6206	0.48
	extraposed	19.4	1741	0.59

Table 7: Effect of position of the relative clause on the distribution of *se*- (vs. *þe*-) relatives in three OE periods

The data in table 7 is compatible with the hypothesis that the effect of the contextual factor ‘position’ is weakened rather than constant across the three periods since the factor weights develop coherently towards a value of 0.5. However, the ranges between the factor weights are still very low (range of in situ: 3; range of extraposed: 5). Regarding the factor group ‘antecedent’, factor weights for antecedents that presumably favour modification by restrictive relative clauses generally stay very low (definite DPs, bare pronouns, universal quantification, etc.). Thus, restrictive context is not strengthened as a conditioning factor for the occurrence of *þe*-relatives, but it does not appear to be measurably weakened either. Factor weights for antecedents that are more likely to appear with non-restrictive relative clauses, on the other hand, drop quite sharply, as illustrated in Table 8. The factor weights for existentially quantified DPs are, however, an exception in that they remain quite constant.

Time Period	Antecedent	% <i>se</i> -relatives	Total	Factor Weight
9 th century	complex name	86.5	170	0.94
	bare nominal	73.8	221	0.85
10 th century	complex name	55.2	29	0.90
	bare nominal	41.1	124	0.82
11 th century	complex name	29.1	206	0.79
	bare nominal	29.4	309	0.79

Table 8: Effect of two antecedent types on the distribution of *se*- (vs. *þe*-) relatives in three OE periods

The data in Table 8 suggests that the conditioning effect of non-restrictiveness on the preference for *se*-relatives does indeed weaken over time since the factor weights for complex names and bare nominals coherently decline across the three OE periods (range of complex name: 15; range of bare nominal: 6).

If this analysis is correct, the significant effects of contextual factors like ‘restrictiveness’ are not the result of a sequential actuation of the change, but remnants of earlier, more rigid conditions. The rate of change is not constant across all linguistic contexts, but speeds up in cases where non-restrictiveness as a conditioning factor is gradually lost. In fact, I would go so far as to suggest that grammar competition between the *se*- and *þe*-rules might be a direct consequence of the loss of their respective conditioning factors.

3.3. Frequency prediction for the overlapping *seþe*-form

Putting together the findings of the previous two sections, the OE rules generating *se*- and *þe*-relatives appear to be a hybrid case between independent rules and conditioned rules. The two rules seem to compete with each other and the effect of the contextual factor ‘clause type’ is constant across the OE period, suggesting rule independence. At the same time, the effects of ‘restrictiveness’ and possibly also ‘position of the relative clause’ appear to be gradually neutralized, which indicates limited and weakening rule conditioning.

This analysis leads to the following prediction for the frequency of the overlapping *seþe* form. The frequency of $P(se \cap þe)$ should lie between 0, expected under rule conditioning, and $P(se) \cdot P(þe)$, which would result from rule independence, precisely because the two rules are neither absolutely independent nor absolutely conditioned. Moreover, as the conditioning factors gradually wear off, the frequency of the overlapping form should gradually approach the values expected under rule independence.

4. Frequency of OE *seþe*-relatives

I will now test the frequency predictions for OE *seþe*-relatives developed in the previous section. In order to do this, I collected *se*-, *þe*- and *seþe*-relatives for all contexts in OE prose texts as well as for three more specific subcontexts: proper names, bare nominal and definite DP antecedents. As in the previous study, the data was taken from Taylor et al. (2003) and categorized into three different periods: 9th century, 10th century and 11th century texts. An example set of the three relative forms is given for proper name antecedents in (12).

(12) a. proper name antecedent, *se*-relative

On þam geare *THOMAS* se wæs gecoran biscop to Eferwic com to Cantwareberig
in that year Thomas who was chosen bishop to York came to Canterbury
‘This year, Thomas, who was chosen bishop of York, came to Canterbury.’
(cochronA-7, ChronA_[Plummer]:1070.6.1465)

b. proper name antecedent, *þe*-relative

Ða geseah *Iudas* þe hýne belæwde þæt he fordemed wæs
then saw Judas who him betrayed that he damned was
‘Then Judas, who had betrayed him, saw that he was condemned.’

(cowsgosp,Mt_[WSCp]:27.3.1993)

c. proper name antecedent, *seþe*-relative

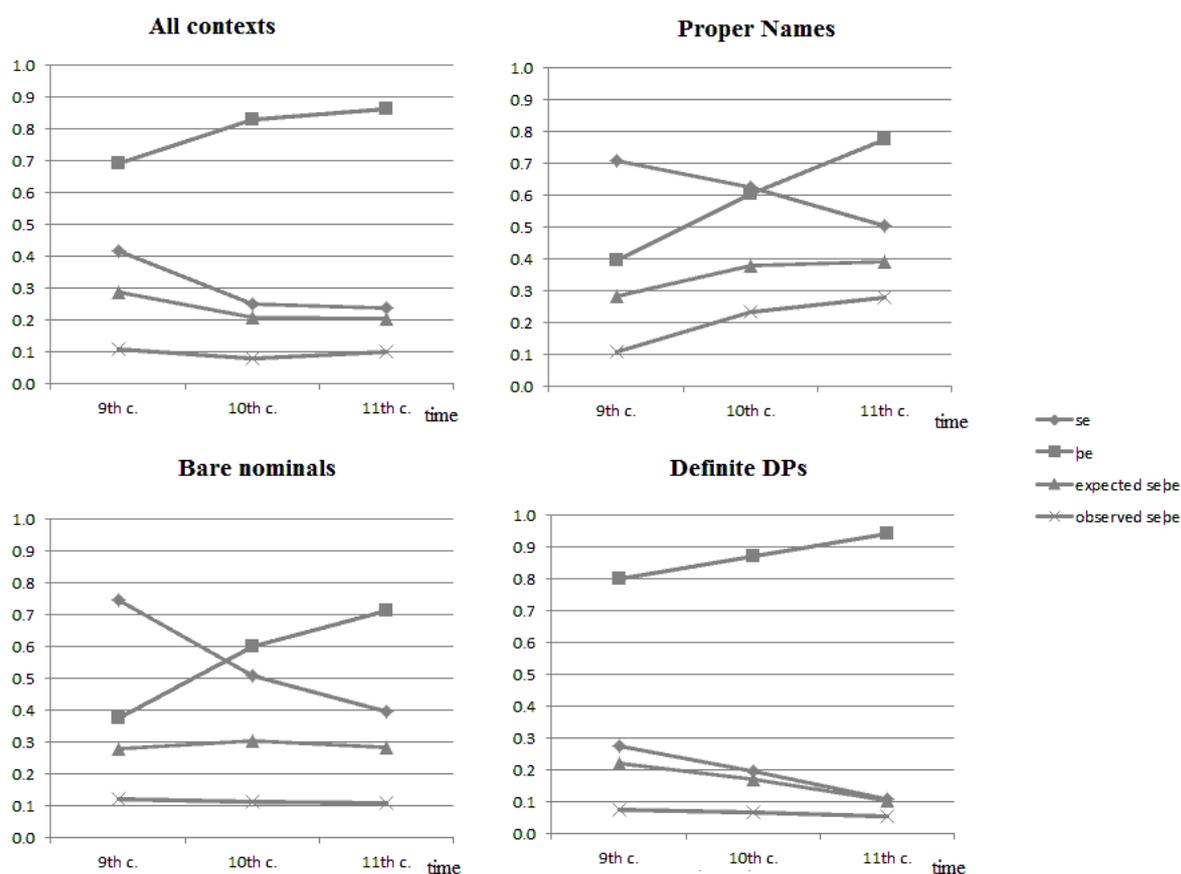
He oncneow *Lazarum* þone⁸ þe he ær forseah
 he recognized Lazarus whom that he earlier saw
 ‘He recognized Lazarus who he had seen earlier.’
 (cocathom1,ÆCHom_I, 23:368.98.4603)

The results of this investigation are shown in Table 9 and illustrated in Graphs 1-4.

Context	Time Period	# Relative Clauses	<i>se</i>	<i>þe</i>	Expected <i>seþe</i>	Observed <i>seþe</i>
All clauses	9th c.	6691	2792 (42%)	4634 (69%)	1934 (29%)	735 (11%)
	10th c.	3254	815 (25%)	2702 (83%)	677 (21%)	263 (8%)
	11th c.	9140	2162 (24%)	7888 (86%)	1866 (20%)	910 (10%)
Proper names	9th c.	186	132 (71%)	74 (40%)	53 (28%)	20 (11%)
	10th c.	86	54 (63%)	52 (60%)	33 (38%)	20 (23%)
	11th c.	349	176 (50%)	271 (78%)	137 (39%)	98 (28%)
Bare nominals	9th c.	294	219 (74%)	111 (38%)	83 (28%)	36 (12%)
	10th c.	153	78 (51%)	92 (60%)	47 (31%)	17 (11%)
	11th c.	401	159 (40%)	286 (71%)	113 (28%)	44 (11%)
Definite DPs	9th c.	2672	734 (27%)	2139 (80%)	588 (21%)	201 (8%)
	10th c.	1173	231 (20%)	1022 (87%)	201 (17%)	80 (7%)
	11th c.	3644	403 (11%)	3433 (94%)	380 (10%)	192 (5%)

Table 9: Frequency of OE relativization through the forms *se* and *þe*, and the expected and observed frequencies of their overlapping form *seþe*, in four different contexts

⁸ Here, *þone* is accusative, masculine, singular of *se*.



Graphs 1-4: Frequency of OE relativization through the forms *se*, *be*, expected and observed frequencies of and their overlapping form *sepe* in four different contexts

The results of this study are as follows. Firstly, the overlapping *sepe*-form exists in all contexts with an appreciable frequency. Furthermore, in all contexts, the overlapping form is considerably less frequent than what would be expected if the two base rules were completely independent. The average difference between expected and observed *sepe*-relatives is 13% for all clauses, 14% for proper name, 17% for bare nominal and 9% for definite DP antecedents. These findings are fully compatible with the hypothesis that the OE *se*- and *be*-relative rules are partly independent and thus allow doubly filled COMP relatives and partly conditioned, inhibiting overlapping forms.

Secondly, the findings also show that, in general, expected and observed frequencies of *sepe*-relatives approach each other as time passes. The differences between expected and observed values decline significantly from 18% to 10% for all clauses, from 17% to 9% for proper name antecedents and from 13% to 5% for definite DPs; solely bare nominal antecedents remain relatively stable.⁹ For all clauses combined, there is actually a slight increase in *sepe*-forms in the eleventh century, which could be interpreted as conditioning factors having weakened so much that the *se*- and *be*-rules, now much more independent, were more likely to be applied simultaneously than in earlier centuries despite the fact that one of the base rules was becoming extinct. All in all then, these findings support the claim

⁹ 9th vs. 11th century: all clauses: Chi-Square: 17.738, df=1, p<0.01; proper names: Chi-Square: 4.823, df=1, p<0.05; definite DPs: Chi-Square: 10.57, df=1, p<0.01; bare nominals: Chi-Square: 0.163, df=1, p>0.05.

that contextual factors like ‘restrictiveness’ do not influence the rules generating *se-* and *þe-* relatives uniformly across the three periods but weaken over time.

5. Conclusion

In this paper, I suggested that grammatical rules can apply independently of contextual factors or be conditioned on them. Only the former type allows simultaneous rule application and thus overlapping forms. If contextual factors influence the distribution of two competing forms as a result of sequential activation of a change, their effect will be constant across the period of change (rule independence leading to constant rate effects). On the other hand, contextual factors can also be at first rigid determinants for the distribution of two forms (rule conditioning), but then weaken over time so that their effect on the distribution of two competing forms declines. I presented a case study of OE relative clauses, which were analysed as falling in between the two extremes of rule independence and rule conditioning to illustrate and substantiate these assumptions.

There is ample room for future research. Firstly, the claims made here should be tested against other syntactic constructions that allow overlapping forms. Specifically, it would be predicted that overlapping forms are possible only in contexts where no conditioning factors are discernible. Secondly, rule conditioning could be tested in a phenomenon that mirrors the development of OE relative clauses: rather than the loss of conditioning factors instigating competition between two forms, there might be initial rule independence leading to grammar competition with subsequent conditioning during a period of change. This is not an implausible idea since it is known that children can impose new conditioning factors on variable input during the acquisition process (e.g. Hudson Kam & Newport 2005). The conditioning of German verb-second vs. verb-final orders on clause type may be such a case. Finally, OE relative clauses themselves require more attention. There may be more contextual factors than were identified here (e.g. heaviness of the relative clause, grammatical function of the relativised constituent, etc.). Furthermore, the descriptive generalizations need to be formally implemented in a theoretical grammar framework.

If the hypothesis put forward here – that overlapping forms are accidental by-products of simultaneous independent rule application governed by statistical principles – is correct, it would follow that (i) grammar competition operates on individual rules rather than entire grammars or parameters (contra Yang 2002) and (ii) that rules in competition have associated with them a weight determining their relative probability of application. Both consequences have profound implications for formal language modelling as well as our understanding of language change in general.

Acknowledgments

I would like to thank Rachel Nye for her encouragement, Eefje Boef for her helpful review as well as the audience of *ConSOLE XX* (Leipzig) for stimulating discussions.

Richard Zimmermann
University of Geneva
Richard.Zimmermann@unige.ch

References

- Andrew, S. O. (1940). *Syntax and Style in Old English*. New York: Russel and Russel.
- Arnold, D. (2004). Non-restrictive relative clauses in construction-based HPSG. Müller, S. (ed.), *Proceedings of the 11th International Conference on Head-Driven Phrase Structure Grammar*. CSLI Publications, Stanford, CA, pp. 26-46.
- Campbell, A. (1959). *Old English Grammar*. Oxford: Clarendon.
- Clark, B. (2004). *A Stochastic Optimality Theory Approach to Syntactic Change*. [Dissertation. Department of Linguistics. Stanford University.]
- Diertani, C. E. A. (2008). Historical Developments in the Marking of English Relative Clauses. [Paper presented at the 32nd Annual Penn Linguistics Colloquium. 23th February 2008.]
- Ellegård, A. (1953). *The Auxiliary do: The Establishment and Regulation of Its Use in English*. Almqvist and Wiksell, Stockholm.
- Fischer, O., Kemenade, A. van, Koopman, W. & Wurff, W. van der (2001) *The Syntax of Early English*. Cambridge: Cambridge University Press.
- Frisch, S. (1997). The change in negation in Middle English: a NegP licensing account. *Lingua* 101, pp. 21–64.
- Hawkins, J. A. (1994). *A Performance Theory of Order and Constituency*. Cambridge University Press, Cambridge.
- Hogg, R. (1979). Old English Palatalization. *Transactions of the Philological Society* 77:1, pp. 89-113.
- Hudson Kam, C. L. & E. L. Newport (2009). Getting it right by getting it wrong: When learners change languages. *Cognitive Psychology* 59:1, pp. 30–66.
- Jespersen, O. (1917). *Negation in English and other languages*. Copenhagen: Hoest and Son.
- Kemenade, A. van (1987). *Syntactic case and morphological case in the history of English*. Foris, Dordrecht.
- Keyser, S.J (1975). A partial history of the relative clause in English. Grimshaw, J. (ed.), *Papers in the History and Structure of English: University of Massachusetts Occasional Papers in Linguistics vol.1*. University of Massachusetts Press, Amherst MA, pp. 1–33.
- Kroch, A. (1989). Reflexes of grammar patterns of language change. *Language Variation and Change* 1, pp. 199-244.
- Kroch, A. (1994). Morphosyntactic Change. Beals, K. (ed.) *Proceedings of the 30th Annual Meeting of the Chicago Linguistics Society*. Chicago Linguistics Society, Chicago, pp. 180–201.
- Mitchell, B. (1985). *Old English Syntax*. Clarendon, Oxford.
- Pintzuk, S. (1999). *Phrase Structures in Competition: Variation and Change in Old English Word Order*. Garland: New York.
- Romaine, S. (1984). Some historical and social dimensions of syntactic change in Middle Scots relative clauses. Blake, N.F. & C. Jones (eds.) *English historical linguistics: Studies in development*. University of Sheffield Press, Sheffield, pp. 101-22.
- Suárez, C. (2006). *Relativization in Early English (950-1250), the position of relative clauses*. Peter Lang, Bern.
- Suárez, C. (2012). The consolidation of *þat* as an invariable relativizer in the history of English. *Nordic Journal of English Studies* 11:1, pp. 79-107.
- Traugott, E. C. (1992). Syntax. Hogg, R. (ed.) *The Cambridge Encyclopedia of the English Language. Vol. 1. The Beginning to 1066*. Cambridge University Press, Cambridge, pp. 168-289.
- Troup, A. C. (2010). *The Relative Clause in Old English: An Analysis of Syntactic and Stylistic Ambiguity*. Mellen Press, Lewiston.
- Wallage, P. (2007). Jespersen's Cycle in Middle English: Parametric variation and grammatical competition. *Lingua* 108, pp. 643-74.
- Yang, C. D. (2002). *Knowledge and Learning in Natural Language*. Oxford University Press, Oxford.

Corpora, Software and text editions used

- Brehe, S. K. (1990). Reassembling the First Worcester Fragment. *Speculum* 65:3, p. 530.
- Morris, R. (1868). *Old English homilies and homiletic treatises (Sawles warde, and þe wohunge of Ure Louerd: Ureisuns of Ure Louerd and of Ure Lefdi, &c.) of the twelfth and thirteenth centuries*. EETS 29,34. N. Trübner & Co., London.
- Buchholz, R. (1890). *Die Fragmente der Reden der Seele an den Leichnam: In Zwei Handschriften zu Worcester und Oxford*. Deichertsche Verlagsbuchhandlung, Leipzig.
- Kroch, A. & A. Taylor (2000). *Penn-Helsinki Parsed Corpus of Middle English, second edition*.

- Morris, R. (1873). *Old English Homilies of the Twelfth Century: From the Unique MS. B.14.52 in the Library of Trinity College, Cambridge Vol. 2*. EETS o.s. 53. Oxford University Press. Oxford.
- Pintzuk, S. & L. Plug (2001). The York-Helsinki Parsed Corpus of Old English Poetry.
- Taylor, A., A. Warner, S. Pintzuk & Beths, F. (2003). *The York-Toronto-Helsinki Parsed Corpus of Old English Prose*.
- Randall, B. (2004). *Corpus Search 2*.
- Robinson, J., H. Lawrence & S. Tagliamonte (2001). *GoldVarb 2001: A multivariate analysis application for Windows*.