

Jespersen's Cycle in Middle English: Parametric Variation and Grammatical Competition

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September 3, 2007

Abstract

This paper evaluates syntactic models of Jespersen's Cycle (Jespersen, 1917). Two types of model are examined: Neg-criterion based approaches, and morphosyntactic feature based approaches. These two types of analysis characterise the parameters involved in Jespersen's Cycle in different ways. Different morphosyntactic options are in competition within the two syntactic models. So the two analyses make different predictions concerning the patterns of variation and change we ought to find in historical data. Detailed quantitative study of diachronic data from Middle English tests these predictions, and provides an empirical basis to evaluate different structural analyses. The Middle English data provide evidence that two forms of *ne* should be distinguished within Jespersen's Cycle. I argue that a morphosyntactic feature based analysis makes the required distinction, and propose an account of Jespersen's Cycle based on morphosyntactic features.

Keywords: negation, Middle English, syntactic change, grammar competition, corpus linguistics, syntax.

*The research presented here is based on chapters 4 and 5 of my doctoral thesis. I would like to acknowledge the financial support of the Arts and Humanities Research Council (UK), who funded my doctoral research, and the Economic and Social Research Council (UK) who funded my postdoctoral fellowship, during which this paper was written. Particular thanks goes to Anthony Warner who supervised my doctoral work, for detailed discussion of the ideas presented here. Thanks also to Eric Haeberli and Susan Pintzuk for their comments and suggestions. Correspondence: Phillip.Wallage@manchester.ac.uk

1 Introduction

The way sentential negation¹ is marked in Early English changes. In Middle English (1150-1500) sentential negation is marked in three different ways at different times during the period (1)-(3). Jespersen (1917) observes a pattern in the way sentential negation changes. The three ways of marking sentential negation are ordered over time in a particular way. This pattern has become known as Jespersen's Cycle, and recurs in many Germanic languages, including not only English but also Dutch and German. Jespersen's Cycle is exemplified below with early English data.

(1) Stage One: Sentential negation is marked by *ne* alone (c.1150-1300).

a. we **ne** moten halden Moses e lichamliche
we NEG need observe Moses' law bodily
'we need not observe Moses law in body'
(CMLAMBX1,89.735)

b. we **ne** mugen þat don
we NEG can that do
'We cannot do that'
(CMTRINIT,103.1369)

(2) Stage Two: The sentential negator *not* co-occurs with *ne*. Sentential negation comprises two parts (c. 1150-1400).

a. ac of hem **ne** speke ic **noht**
but of them NEG spoke I not
'but I did not speak of them'
(CMTRINIT,95.1271)

b. I **ne** may **nat** denye it
I NEG may not deny it
'I may not deny it'
(CMBOETH,435.C1.262)

(3) Stage Three: Sentential negation is marked by *not* alone. (c.1350-1500).

a. Thou sall **noghte** do so
You ought not do so
'You ought not do so'
(CMROLLTR,43.880)

¹Negation which takes scope over an entire clause.

- b. I know **nat** the cause
I know not the cause
'I do not know the cause'
(CMMALORY,627.3550)

A negative marker affixed to the finite verb becomes supplemented by an adverbial negative marker (2) before it is lost altogether, leaving the adverbial marker as the only marker of sentential negation.

Throughout Middle English, there is considerable variation between three types of negative marking, *ne*, *ne...not* and *not*, even within individual texts. However, the underlying trend is one of gradual change. The verbal affix *ne* predominates as the sentential negative marker in Early Middle English (EME, c.1150-1350) whilst the adverbial *not* predominates as the sentential negative marker in Late Middle English (LME, c.1350-1500). In the transition between Early and Late Middle English we often find sentential negation marked using both *ne* and *not* in combination (2).

This paper examines the distribution in Middle English of the three types of negation which constitute Jespersen's Cycle. It addresses the syntactic analysis of each type, and the nature of the changes involved in the Middle English Jespersen's Cycle.

The existence of large scale corpora crucially provides sufficient data, in an easily searchable form, to make possible quantitative and statistical modelling of variation in negation within historical textual data. Throughout this paper I use the second edition of the Penn-Helsinki Parsed Corpus of Middle English (=PPCME2) (Kroch and Taylor, 2000) which comprises 1.5 million words distributed across the period 1150-1500. These data represent the actual usage of individuals in real time over a period of 350 years. Furthermore, the corpus is tagged and parsed to facilitate searching for syntactic structures.

Table 1 shows the overall distribution of *ne*, *ne...not* and *not* in the PPCME2 corpus. All the data for this paper come from exhaustive searches of the prose texts² in the PPCME2. The data are subdivided into four periods according to date³, two early Middle English periods of a century each (1150-1250, 1250-1350) and two late Middle English periods, one comprising 80 years (1350-1430), the other 70 years (1430-1500).

This paper is concerned with the syntactic analysis of Jespersen's Cycle within Principles and Parameters theory, in a way which accommodates patterns of variation and change in Middle English. I will show that patterns of variation and change in historical data inform the syntactic analysis of negation. Analysis of patterns of variation gives us a

²That is all the texts in the PPCME2 except the *Ormulum*.

³Owing to the difficulty of assigning dates of composition for some texts, the texts are categorised according to manuscript dates, which are more reliably ascertained.

Period	ne	%	ne...not	%	not	%	Total
1150-1250	436	60.5%	277	38.5%	7	1.0%	720
1250-1350	166	22.9%	490	67.7%	68	9.4%	724
1350-1430	43	1.9%	236	10.5%	1959	87.5%	2238
1430-1500	14	0.8%	18	1.0%	1842	98.2%	1874
Total	660	16.3%	1021	20.7%	3876	63.0%	5557

Table 1: The distribution of the three forms *ne*, *ne...not*, *not* in the PPCME2 data. All clause types. NB contracted forms of *ne* excluded.

way to evaluate different syntactic analyses. Different analyses make available different inventories of morphosyntactic options. So each analysis structures variation and change in a different way. It is therefore possible to evaluate each analysis by testing whether the patterns of variation predicted under a particular analysis are in fact instantiated in the data.

Jespersen’s Cycle raises one particular problem for a syntactic analysis which is the focus of this paper. This is the syntactic relationship between *ne* and *not* during the change. *not* does not simply replace *ne*. Instead, *ne* and *not* co-occur for a time. We cannot regard the changes involved in Jespersen’s Cycle as a single parametric change. So, why is *not* introduced to supplement *ne*, when *ne* formerly marked sentential negation perfectly well on its own? Superficially at least, the co-occurrence of *ne* and *not* at stage two of the cycle appears redundant to the marking of negation. At other stages of Jespersen’s Cycle, negation is marked by only one morpheme. How can we accommodate this apparent redundancy within a syntactic analysis?

I will compare two approaches to the issue, which derive Jespersen’s Cycle using different syntactic structures, and characterise the change in different ways. It follows that these syntactic approaches provide different inventories of syntactic possibilities. The interaction of these syntactic possibilities constrains the patterns of variation possible under each analysis. Under each analysis, the changes involved in Jespersen’s Cycle are different. So the inventory of structural options becomes crucial to understanding variation in corpus data. Each particular syntactic analysis defines and delimits the shape of any possible variation, restricting it to a choice between the structural options made available under the analysis. Patterns of variation which are possible under one analysis may not be possible under the other. So each syntactic analysis can be evaluated: the patterns of variation predicted by each analysis can be tested against the patterns of variation found in empirical data.

The structure of the paper is as follows. In the next section, I outline the two syntactic analyses of Jespersen’s Cycle which the paper compares (section 2). I discuss how

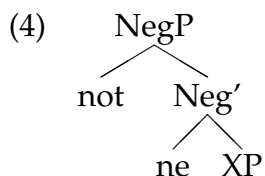
each analysis structures the changes involved in Jespersen’s Cycle in different ways, and explain how we can test each analysis against patterns of variation in quantitative data. Section 3 outlines the corpus of historical data used for the quantitative analysis. In particular, it is clear that not all Middle English negative clauses exemplify one of the three stages of Jespersen’s Cycle. The database needs to be constrained before quantitative analysis can be carried out, as I explain in section 3.

In sections 4 and 5, I test the patterns of variation and change predicted by each analysis against the patterns found in the Middle English database. In section 6 I argue that the distribution of redundant negation provides further evidence to choose between the two analyses. Section 7 uses the findings to argue for an account of Jespersen’s Cycle based on morphosyntactic features. I conclude by examining some of the implications of my findings for syntactic accounts of negation and morphosyntactic change which have been proposed in recent literature (section 8).

2 Two syntactic accounts of Jespersen’s Cycle

In this section, I outline the two syntactic accounts of Jespersen’s Cycle that I will be concerned with throughout the rest of this paper. We will see that there are differences between the patterns of variation and change each analysis makes available to account for Jespersen’s Cycle. These differences will become particularly important when we model the progress of Jespersen’s Cycle in diachronic data (sections 4 and 5).

Since Pollock (1989), it has been customary in the Principles and Parameters framework to assign negation its own functional head in the syntactic representation of the clause. Frisch (1997) and van Kemenade (2000) take *ne* to be the morphological realisation of this head in Middle English. Furthermore, Frisch (1997) and van Kemenade (2000) assume that the negative head projects a specifier position, as is customary in X' -theory, and that *not* occupies this position. So negation is represented in syntax by a negative phrase NegP (4). At stage two of Jespersen’s Cycle, when *ne* and *not* co-occur, both the head and specifier of NegP contain overt lexical material. This is the structural representation for negation I will assume.



Recall that I raised the question of the relationship between *ne* and *not* throughout Jespersen’s Cycle. We are now in a position to restate the problem within a syntactic

framework. What is the relationship between a syntactic head (*ne*) and its specifier (*not*)? Does the syntax require every head (*ne*) to project a specifier even when there is no morphologically overt specifier element (*not*), such as at stage one of Jespersen's Cycle? Is the relationship between a head and its specifier a matter of Principles (that is, invariant), or a matter of Parameters (potentially variable or changeable)?

The two approaches to Jespersen's Cycle I examine take different positions on the relationship between a head and its specifier. One group of approaches propose that the relationship between the head *ne* and its specifier is fixed throughout Jespersen's Cycle (Jespersen's Cycle as a morphological change, section 2.1). The other group propose that the relationship between the head *ne* and its specifier changes during Jespersen's Cycle (Jespersen's Cycle as a morphosyntactic change, 2.2). These two approaches give different accounts of the variation and change which constitutes Jespersen's Cycle in Middle English.

2.1 Jespersen's Cycle as a morphological change

The Neg-criterion (Haegeman, 1995) makes a specifier-head relation between the two different types of negative markers (5) a condition on the syntax of sentential negation.

(5) The Neg-criterion:

- a. Each Neg X^0 must be in a spec-head relationship with a Neg operator.
- b. Each Neg operator must be in a spec-head relationship with a Neg X^0 .
- c. NEG-operator: a NEG phrase in a scope position
- d. Scope position: a left-peripheral A'-position (i.e. XP-adjoined or Spec).

(Haegeman, 1995, 106)

Under this schema, negation always comprises two parts in all languages. The negative head is never sufficient to express negation on its own. Even when it is the only overt negative element, a null negative operator is required in the specifier of NegP. Under this approach, Jespersen's Cycle is simply a change in the morphological realisation of the two underlying syntactic positions for negation: Neg⁰ and spec,NegP. The introduction of *not* reflects the replacement of a null operator by a morphologically overt one. Similarly, the loss of *ne* reflects the replacement of a morphologically overt head by a null one.

In a similar way, the analyses of negation proposed by Zeijlstra (2004) and Roberts and Roussou (2003) rely on a fixed syntactic relationship between the exponents of sentential negation. Zeijlstra (2004) relates the negative head and negative specifier through

a feature-checking relationship. A negative specifier is required to check a morphosyntactic feature on the negative head. Zeijlstra (2004) assumes that this feature-checking configuration holds at stage one of Jespersen's Cycle, as well as at stage two where the co-occurrence of *ne* and *not* provides overt evidence for it. Whilst the operator is overt at stage two of Jespersen's Cycle, at stage one, the spec,NegP position is filled by a null negative operator.

The cartographic approach to clause structure taken by Roberts and Roussou (2003) also entails that there are always two underlying syntactic positions for negation, either or both of which can be lexicalised. Within Roberts & Roussou's system, the only axis of parametric variation is in the lexicalisation of a range of functional positions which exist in a fixed structure (Roberts and Roussou, 2003, 29). Under this approach, the requirement of each position to be lexicalised changes to derive Jespersen's Cycle. There is no variation or change in the inventory of syntactic positions associated with negation.

It follows from all three of these approaches that Jespersen's Cycle comprises two independent morphological changes. The change is a morphological one and does not affect the syntactic structures or relationships which underlie sentential negation in any way. The loss of *ne* represents the loss of lexical content from one negation position. The introduction of *not* represents the development of lexical content to realise the other negation position, presumably through grammaticalisation of a negative adverb. The appearance of both *ne* and *not* at stage two of Jespersen's Cycle reflects the intersection of the two changes across time.

Under this account, the inventory of negative items includes two negative operators, a null one and an overt one; and two negative heads, again, a null one and a morphologically overt one. Changes affecting the operator in spec,NegP are independent of changes affecting the head Neg⁰.

2.2 Jespersen's Cycle as a morphosyntactic change

A second group of approaches proposes that Jespersen's Cycle involves change in morphosyntactic features rather than simply changes in the lexical realisation of underlying syntactic positions. Principal amongst these approaches is Rowlett (1998). In this section, I will describe Rowlett's analysis and show how his approach fits in to a Minimalist conception of morphosyntactic features and relations.

Rowlett (1998) argues that the transition from stage one to stage two of Jespersen's Cycle reflects a morphosyntactic feature change. At stage one, when *ne* negates a clause on its own, Rowlett argues that *ne* has a [+NEG] feature which contributes negation to

the logical form of the clause. However, at stage two, he argues that *ne* does not have a [+NEG] feature. As *ne* loses its [+NEG] feature, another negative such as *not* must be present in the clause to contribute the feature [+NEG] at logical form. So, the introduction of *not* in spec,NegP is not independent in this model. It is a consequence of the loss of [+NEG] on *ne*.

Rowlett's account does not require a negative item in spec,NegP at stage one of Jespersen's Cycle. In fact, he states that this would be redundant when [+NEG] is present on *ne* already.

If all that is needed to mark sentential negation is the presence of the feature [+NEG] on a functional head, then transferring the feature to an operator in specifier position serves no purpose and should arguably not be allowed. Certainly, as an interpretable feature, the presence of [+NEG] on a functional head at LF should not in itself be problematic. Consequently, the presence of a suitable operator in Spec,NegP cannot be motivated for checking reasons. (Rowlett, 1998, 112)

This differs from the approaches discussed in the previous section, like the Neg-criterion (Haegeman, 1995). Recall that this approach requires a specifier-head configuration between a negative specifier and a negative head throughout all stages of Jespersen's Cycle. For our purposes, the most important implication of Rowlett's analysis is that he makes a distinction between two types of *ne* at stages one and two of Jespersen's Cycle. At stage one of Jespersen's Cycle *ne* has [+NEG] features. At stage two it does not. This contrasts with the Neg-criterion based approaches (section 2.2), which assume *ne* is a single lexical item throughout Jespersen's Cycle.

Minimalist approaches such as Chomsky (2000) conceive of morphosyntactic features in a way which accommodates the distinction Rowlett (1998) makes. Chomsky (2000) distinguishes morphosyntactic features according to whether or not they contribute any value to the semantics at LF. Valued features contribute to the semantic interpretation of the clause at LF. Features which are unvalued do not contribute anything to the semantic interpretation of the clause, and must be eliminated from the syntactic representation before LF is reached. This is exactly the kind of distinction Rowlett makes between the two types of *ne*. At stage one of Jespersen's Cycle, *ne* contributes a negative value to the clause's logical form. At stage two *ne* does not contribute a negative value to clause's logical form.

Distinguishing two types of *ne* leads to a different account of Jespersen's Cycle. The transition from stage one to stage two of Jespersen's Cycle represents the loss of the se-

semantic value ‘negative’ from *ne*. The transition from stage two to stage three of Jespersen’s Cycle represents the loss of the morpheme {*ne*} itself. This splits the loss of *ne* into two processes. The loss of morphology lags behind the loss of semantic features. Once *ne* is no longer associated with the semantic value ‘negative’, another negative element such as *not* must be introduced to the clause which has the semantic value ‘negative’. Hence the *ne...not* forms we find at stage two of the cycle.

An account which has two forms of *ne* at successive stages of the cycle has important implications for the study of Jespersen’s Cycle as a diachronic change. The two forms of *ne* are distinct lexical items with different morphosyntactic feature specifications. If this analysis is correct, we should be able to distinguish the two forms of *ne* in historical data. They should be independent of each other in their distribution and subject to different patterns of change.

3 Database and methodology

The data are taken from exhaustive searches⁴ of the prose texts in the PPCME2 (Kroch and Taylor, 2000). The Middle English data are divided into four periods within the PPCME2: 1150-1250, 1250-1350, 1350-1420, 1420-1500. Subdividing the Early Middle English into longer periods than the Late Middle English because there are fewer Early Middle English data and fewer texts in the early periods. So making the Early Middle English periods longer than the Late Middle English ones allows for a more even spread of tokens across the four periods in light of the fact that there are fewer surviving texts from the earlier periods.

A couple of points concerning the representativeness of the corpus data are pertinent here. There are limitations in the composition of the corpus at different periods which may bias the results of quantitative analysis. First, each period is not equally representative of all dialects. In the period 1150-1250 texts from the West Midlands predominate, whilst most texts in the later periods are localised to the South East or East Midlands. Second, the range of genres and registers is very limited in all periods, owing to the restricted range of texts that survive to us. Most texts in the corpus are religious works. Narrative texts, such as legends and histories are more common in the later periods, but remain under-represented throughout the corpus. The representativeness of the period 1250-1350 is particularly questionable as the data for this period comprise only three texts.

We cannot examine all negative clauses in the corpus. It is clear that not all negative

⁴All the searches were performed using the search tool *CorpusSearch* (Randall, 2000).

clauses are exponents of Jespersen's Cycle. Furthermore, it is clear first that not all negative clauses are subject to change, that Jespersen's Cycle is not the only change affecting negative clauses in Middle English and that not all negative clauses are changing in the same way. So we need to define the data under examination more precisely.

The data under examination are only those which constitute Jespersen's Cycle, that is *ne* which negates a clause on its own, *ne...not* and *not*. Other negative clauses are excluded, on the grounds that they exhibit patterns of variation and change which are different to other sentential negatives. So negatives which have constituent rather than sentential scope are excluded.

Instances of *ne* in multiple negation with negative adverbs or negative NPs are also excluded (6).

- (6) a. thow ne hast noon nede of no juge...
 you NEG have no need of no judge...
 'you have no need of any judge'
 (CMBOETH,448.C2.409)
- b. and no þing þai ne sparede.
 and no thing they NEG spared
 'and they spared nothing' (CMBRUT3,45.1351)
- c. And also ther ne sholde nevere be pees ne reste amonges hem
 and also there NEG should never be peace nor rest amongst them
 'and also there should never be peace or rest amongst them'
 (CMCTPARS,321.C1.1414)

Frisch (1997, 57) asserts that instances of *ne* involved in multiple negation must be excluded from quantitative models of Jespersen's Cycle. What emerges clearly from the PPCME2 data is that *not* is much less frequent in clauses with negative quantifiers or negative adverbials (7) than in clauses without these quantifiers or adverbials (see the figures in Table 2).

- (7) a. ...thou ne schalt nat seen in no place no thing of yvel
 ...you NEG shall not see in no place no thing of evil
 '...you shall see nothing of evil anywhere'
 (CMBOETH,454.C2.564)
- b. Þou schalt not bere no false wyttenes aʒeynys no man, by no way
 you ought not bear no false witness against no man, by no way
 'You ought not bear false witness against any man in any way'
 (CMMIRK,103.2795)

Period	ne...negQ	not...negQ	Total negQ	% not
1150-1250	528	4	621	0.6%
1250-1350	190	2	245	0.8%
1350-1420	133	70	1308	5.4%
1420-1500	14	78	1345	5.8%

Table 2: The distribution of *not* in clauses with negative quantifiers

So Jespersen's Cycle does not progress in the same way in clauses with negative quantifiers or adverbials as it does elsewhere. Hence it is not clear how multiple negation with *ne* relates to Jespersen's Cycle. However, multiple negation contexts are sufficiently different from sentential negation contexts to be excluded from the analysis here. They pose additional questions best addressed elsewhere.

Therefore, for the purposes of this paper, an instance of *ne* is only counted when it negates a clause on its own, or when it appears in combination with *not*. Similarly, an instance of *not* is only counted when it negates a clause on its own or appears in combination with *ne*. Instances of *ne* or *not* which co-occur with negative quantifiers or negative adverbs are excluded.

Certain finite verbs like *be* and modals exhibit negative forms. These negative forms appear both without *not* (8) and with *not* (9).

- (8) a. now **nyle** thou do synne, lest any worse thing bifalle to thee.
now NEG-will you do sin, lest any worse thing befalls to you
'Now you will not sin, in case anything worse happens to you'
(CMNTEST,V,1.386)
- b. For certes, ther is no deedly synne, that it **nas** first in mannes
For certain, there is no deadly sin, that it NEG-was first in man's
thought
thought
'Truly, there is no deadly sin that was not first in man's thoughts'
(CMCTPARS,295.C2.312)
- (9) a. wit-owte doute holy angeles **nole** nouȝt be fer fro þy chaste bed
without doubt holy angels NEG-will not be far from your chaste bed
'without doubt, holy angels will not be far from your chaste bed'
(CMAELR3,28.76)
- b. For he **nys** nat povre that hath goode freendes
For he NEG-is not poor who has good friends
'for he who has good friends is not poor'
(CMCTPARS,292.C1.167)

We might analyse these forms as products of a process by which *ne* contracts and fuses with the verb. Alternatively, we might regard these forms as distinct lexical items, with distinct histories and paths of development. It is not clear whether these forms are included by Frisch (1997) in his quantitative analysis of Jespersen’s Cycle. However, I exclude these contracted negatives from the analysis presented here principally because the distribution of *not* with these forms is different from the distribution of *not* with full or uncontracted forms of *ne*, particularly in the Late Middle English period 1350-1420 (see the figures in Table 3).

Period	Contracted neg			Uncontracted neg		
	not	Total	% not	not	Total	% not
1150-1250	153	379	40%	277	713	39%
1250-1350	31	51	61%	490	656	75%
1350-1420	40	81	49%	236	279	85%
1420-1500	1	13	8%	18	32	56%

Table 3: The distribution of *not* with contracted and uncontracted forms of *ne*

Differences in distribution indicate that negative verbs like (8) and (9) should be considered separately. The data in Table 3 show that *not* is much more common in Late Middle English clauses with *ne* than in clauses with negated verbs like (8) and (9). This indicates that negative verbs become differentiated from *ne* in Late Middle English, perhaps lexicalised, listed in the lexicon as exceptions to general patterns of variation or change. So in our discussion of Jespersen’s Cycle, negative verbs like (8) and (9) are best set aside. For the remainder of this paper, I examine the progress of Jespersen’s Cycle with uncontracted forms of *ne* only.

There are also two uses of *ne* which are excluded from the database. These two uses of *ne* might be confused with *ne* at stage one of Jespersen’s Cycle, but they are functionally distinct and exhibit very specific constraints on their distribution. The first is *ne* which is used redundantly. When *ne* appears in certain subordinate clauses it does not contribute negation to the semantic interpretation or logical form its clause. Redundant *ne* appears in the complement clauses of certain verbs like *doute*, *denye* ‘doubt, deny’ which express doubt, denial or prohibition (10).

- (10) And of alle thise things ther nis no doute that thei **ne** ben doon
 And of all these things there NEG-is no doubt that they NEG are don
 ryghtfully and ordeynly...
 rightfully and as ordained...
 ‘and of all these things there is no doubt that they are done rightfully and as or-
 dained...’

(CMBOETH,453.C2.536)

These examples of *ne* are excluded from the quantitative analysis because they are never interpreted as negation at LF, unlike *ne* in other contexts. Hence it is not clear how they relate to Jespersen's Cycle. I will return to the analysis of this form of *ne* in section 6, to show that they should be regarded as a special case historically and syntactically.

Examples of *ne* which appear in clauses with *but(en)* 'but' (11) are also excluded from the database.

- (11) ...certes by nature ther nys but o God
...truly by nature there NEG-is but one God
'...truly by nature there is only one God'
(CMBOETH,433.C1.183)

In these clauses *ne* does not contribute negation to the semantic representation of the clause at LF. Instead, the meaning of *ne...but* is non-compositional. Together *ne* and *but* have the meaning 'only'. Just like the redundant uses of *ne*, these uses of *ne* are never interpreted as sentential negation at any point in Middle English.

So this leaves the following forms of negation in the database:

1. Clauses with uncontracted *ne* representing stage one of Jespersen's Cycle.

- (12) we **ne** moten halden Moses e lichamliche
we NEG might observe Moses' law bodily
'we might not observe Moses law literally'
(CMLAMBX1,89.735)

2. Clauses with uncontracted *ne* in combination with *not* representing stage two of Jespersen's Cycle.

- (13) I **ne** may **nat** denye it
I NEG may not deny it
'I may not deny it'
(CMBOETH,435.C1.262)

3. Clauses with *not* representing stage three of Jespersen's Cycle.

- (14) I know **nat** the cause
I know not the cause
'I do not know the cause'
(CMMALORY,627.3550)

All other forms or patterns of negation are excluded from the quantitative analysis of Jespersen's Cycle presented here.

Having established the composition of the database, I now turn to a few remarks on methodology. In the next sections, I use quantitative methods familiar from studies of variation in Present Day English. Recall that the two syntactic approaches to Jespersen's Cycle which I discussed in section 2 involve different syntactic options. It follows that each account predicts different patterns of variation and change in the database, which can be empirically tested against the patterns of variation we actually find. In particular, the two syntactic accounts differ according to whether they treat *ne* as a single lexical item or whether they make a distinction between *ne* at stages one and two of Jespersen's Cycle. In the next section, I compare the fit of a model which assumes a single form of *ne* to the distribution of *ne* in the database. In section 5, I examine the database for distributional evidence to distinguish two forms of *ne* at successive stages of Jespersen's Cycle.

4 A quantitative model of Jespersen's Cycle involving a single form of *ne*

4.1 The theoretical basis of Frisch's model

The Neg-criterion (Haegeman, 1995) entails that Jespersen's Cycle must be a change in the morphology associated with underlyingly invariant syntactic positions. This model maintains that changes affecting the realisations of the negative head and the negative operator are independent. This claim is empirically testable. Frisch (1997) develops a quantitative model of Jespersen's Cycle based on these assumptions which we can test using corpus data. He calls this model the 'redundant licensing model', because *ne* and *not* are two independent ways of morphologically licensing NegP. For Frisch, a functional projection must be licensed by containing an overt morpheme or lexeme. At stage two of Jespersen's Cycle NegP is redundantly licensed by overt material in both its positions, *ne* in Neg⁰ and *not* in spec,NegP.

For Frisch, the change under Jespersen's Cycle is comprises two intersecting changes in the way NegP is morphologically licensed or identified. NegP is licensed by morphologically overt material in one or both of its positions. This section outlines Frisch's (1997) account of the changes in Middle English (the redundant licensing model).

For Frisch (1997), Jespersen's Cycle comprises two independent changes:

- The reanalysis of *not* from an adjoined adverb to a negative operator in the specifier

of the functional projection NegP.

- The loss of the morpheme *ne* from the negative head position.

He claims that these two morphological changes are independent, but intersect, resulting in the *ne...not* forms found at stage two of Jespersen's Cycle. The reanalysis of *not* is in advance of the loss of *ne*, meaning that NegP has overt material in both its specifier and head positions for a time. Frisch's account provides a way to examine how Jespersen's Cycle is modelled as morphological change involving a single form of *ne* throughout Middle English, and to examine the fit between the predictions of this model and Middle English data.

Frisch argues that the statistical probability that stage two *ne...not* will appear in the Middle English data is calculated if we multiply the overall probability of *ne* occurring in the database by the overall probability that *not* occurs in the database. This follows if *ne* and *not* are independent changes which intersect. The formula Frisch gives for calculating the probability that *ne...not* will appear is given in (15), where 'P' stands for probability. It states that the probability of *ne...not* is the result of multiplying together the probability that *ne* appears in Neg⁰ and the probability that *not* appears in spec,NegP. In each instance, the probability is simply the likelihood that a particular form will occur, expressed as a percentage of the total negative clauses in the sample.

$$(15) \quad P(\text{ne...not}) = P(\text{ne is used}) \times P(\text{not is used in spec,NegP})$$

(Frisch, 1997, 51)

Frisch (1997, 51) counts both *ne* which occurs alone and *ne* which co-occurs with *not* as exponents of *ne* for the purposes of redundant licensing. Both represent Neg⁰. Similarly, both *not* which appears alone and *not* which co-occurs with *ne* are exponents of *not* for the redundant licensing model. Both represent spec,NegP. This means that the model counts actual instances of *ne...not* twice in order to estimate the frequency of *ne...not*. In order to test the hypothesis that *ne...not* is a product of the independent distributions of *ne* and *not* it would seem better to exclude examples of *ne...not* from the model altogether and concentrate on the frequencies of clauses in which *ne* and *not* actually appear independently of each other. However, for the purposes of comparing the fit of the PPCME2 data to Frisch's model, I will begin by testing the fit of the model in exactly the way Frisch used it, and return to this problem with the model in section 4.3.

4.2 The fit of Frisch’s (1997) model to the PPCME2 data

In this section, I model the frequencies of *ne...not* in the PPCME2 prose data for each of the four subperiods (1150-1250, 1250-1350, 1350-1420, 1420-1500) applying the formula given in (15) to data from each period in exactly the same way as Frisch (1997), counting all instances of *ne* and *not* even when they co-occur. We will observe that the fit of Frisch’s model to data from the PPCME2 (Kroch and Taylor, 2000) is inadequate for Late Middle English because it does not accommodate the different patterns of negation identified in subordinate clauses by Jack (1978).

Table 4 shows the results of the redundant licensing model applied to the PPCME2 data. The first two columns report the overall frequencies of *ne* and *not* in the data. The third column reports the total number of negative clauses in the database. Note that the total number of negative clauses is less than the sum of all clauses with *ne* and all clauses with *not* because some clauses involve both *ne* and *not*. Clauses with both *ne* and *not* are counted twice. The fourth column reports the frequency of *ne...not* predicted by Frisch’s model in (15). The final column reports the actual incidence of *ne...not* observed in the corpus. Therefore we can compare the fit of Frisch’s model (figures in fourth column) with the observed distribution of *ne...not* (figures in fifth column).

Period	ne	not	Total neg cl	Estimated <i>ne...not</i>	Observed <i>ne...not</i>
1150-1250	713 (99.0%)	284 (39.4%)	720	281 (39.1%)	277 (38.5%)
1250-1350	656 (90.6%)	558 (77.1%)	724	506 (70.0%)	490 (67.7%)
1350-1420	279 (12.5%)	2195 (98.1%)	2238	274 (12.3%)	236 (10.5%)
1420-1500	32 (1.7%)	1860 (99.3%)	1874	32 (1.7%)	18 (1.0%)

Table 4: The model of *ne...not* as redundant licensing compared with the observed frequency of *ne...not*, following Frisch (1997, 51ff). Main and subordinate clauses from the PPCME2.

Table 4 shows that whilst the fit of the redundant licensing model for the periods to 1420 is good, the fit of the model is less good for the last Middle English period 1420-1500, with the estimate almost twice the observed frequency of *ne...not*. An observation from Jack (1978) might provide an explanation for the poorer fit of Frisch’s model to the Late Middle English data. Jack observes that the sort of negation found at stage one of Jespersen’s Cycle (*ne*) is not equally common in all types of clauses. In Late Middle English, stage one *ne* becomes increasingly restricted to certain types of subordinate clauses, especially conditional clauses (16) and clauses which are within the scope of negation (17).

- (16) if he ne hadde pitee of mannes soule, a sory song we myghten alle synge
 if he NEG had pity on a man's soul, a sorry song we might all sing
 'if he didn't take pity on a man's soul, we might all sing a sorry song'
 (CMCTPARS,296.C2a.343)
- (17) "it may nat be," seith he, "that where greet fyr hath longe tyme endured, that
 "it may not be," said he, "that where great fire has long time endured that
 ther ne dwelleth som vapour of warmness."
 ther NEG dwells some vapour of warmness."
 ' "it may not be," he said "that where a great fire has been for a long time that it
 isn't warm there" '
- (CMCTMELI,223.C2.269)

This fact is not taken into account by Frisch's model. He does not subdivide the data according to clause type. So if there are many of these kinds of subordinate clauses in the Late Middle English data with *ne*, these will bias the redundant licensing model into overestimating the frequency of *ne...not* overall. Following Jack's observation, it seems right that we should consider main clauses and subordinate clauses separately. As far as I can tell, Frisch (1997) does not separate these clause types in his model of Jespersen's Cycle. Frisch's database is described only as 'declarative clauses' (Frisch, 1997, 31), which I take to include main, conjoined and subordinate clauses. Frisch does not offer a more precise description of the clauses included in his database.

Table 5 shows the results of the redundant licensing model (15) when it is applied to main clause data, and Table 6 when it is applied to subordinate clause data.

Period	ne	not	Total neg cl	Estimated <i>ne...not</i>	Observed <i>ne...not</i>
1150-1250	243 (98.8%)	155 (63.0%)	246	155 (62.9%)	152 (61.8%)
1250-1350	377 (88.7%)	377 (88.7%)	425	334 (78.7%)	329 (77.4%)
1350-1420	111 (10.6%)	1043 (99.7%)	1046	111 (10.6%)	108 (10.3%)
1420-1500	13 (1.4%)	939 (99.9%)	940	13 (1.4%)	12 (1.3%)

Table 5: The model of redundant licensing, following Frisch (1997). Main clauses only.

Once we subdivide the data by clause type, we see that the fit of Frisch's model is good for main clauses throughout Middle English: his estimates for *ne...not* are not very much different from the observed incidence of *ne...not* in the PPCME2 at any period. However, subordinate clauses behave differently to main clauses. In Table 6, the estimated incidence of *ne...not* is higher than observed incidence of *ne...not* especially in the period 1420-1500, but also in the period 1350-1420.

Period	ne	not	Total neg cl	Estimated <i>ne...not</i>	Observed <i>ne...not</i>
1150-1250	470 (99.2%)	129 (27.2%)	474	128 (27.0%)	125 (26.4%)
1250-1350	279 (93.3%)	181 (60.5%)	299	169 (56.4%)	161 (53.8%)
1350-1420	168 (14.1%)	1152 (96.6%)	1192	162 (13.6%)	128 (10.7%)
1420-1500	19 (2.0%)	921 (98.0%)	934	19 (2.0%)	6 (0.6%)

Table 6: The model of redundant licensing, following Frisch (1997). All Subordinate clauses.

The fit of Frisch’s model for Late Middle English subordinate clauses in the period 1420-1500 is poorer for subordinate clauses than for main clauses. Trying to derive the frequency of *ne...not* based on the overall frequencies of *ne* and *not* is problematic for Late Middle English subordinate clauses because these clauses have more *ne* than predicted and fewer *ne...not*.

The only two parameters in Frisch’s model are the appearance of *ne* and *not* in their respective syntactic positions. The frequency of *ne...not* should fall out from the intersection of these two parameters, but in LME subordinate clauses we see that it does not. Whilst the overall frequencies of *ne* and *not* differ in main and subordinate clauses, this alone is insufficient to account for the distribution of *ne...not* in LME subordinate clauses. So we need to explain the poor fit of Frisch’s model for Late Middle English subordinate clauses. In the period 1420-1500, it seems that the distribution of stage two *ne...not* is independent of the distribution of stage one *ne* in a way which lies outside the Neg-criterion analysis on which Frisch’s model is based.

So we need to ascertain whether the poor fit of Frisch’s model at this period is accidental or symptomatic of a more systematic difference between main and subordinate clauses which his model overlooks. We need to determine whether the differences between main and subordinate clauses observed by Jack (1978) for Late Middle English hold throughout Middle English and why these differences exist.

In section 5, I show that the effect of clause type on the distribution of *ne* is systematic and holds throughout Middle English. Furthermore, I show that clause type only conditions the distribution of *ne* at stage one of Jespersen’s Cycle, not at stage two when *ne* co-occurs with *not*. This distributional independence of stage one and stage two *ne* accounts for the poor fit of the redundant licensing model in LME subordinate clauses. Clauses which have more stage one *ne* like conditional clauses do not have more *ne...not* than other clause types. Therefore any attempt to derive the frequency of LME *ne...not* based on the overall frequency of *ne* in subordinate clauses will overestimate the frequency of *ne...not*.

4.3 Some problems with the implementation of the redundant licensing model

As I outlined in section 4.1, Frisch estimates the frequency of *ne...not* using a dataset which includes actual instances of *ne...not*. He counts instances of *ne...not* as exponents of both *ne* and *not*. So he counts clauses involving *ne...not* twice in order to estimate the frequency of *ne...not*. He assumes that *ne* and *not* which co-occur as *ne...not* behave in exactly the same way as *ne* and *not* which occur independently of each other.⁵ This assumption may obscure differences between the distribution of *ne*, *ne...not* and *not* in the data which might point to *ne...not* being a syntactically and distributionally distinct form.

So, it seems proper here to challenge Frisch's assumptions, in order to truly ascertain whether *ne...not* results from the independent and intersecting use of *ne* and *not*, or if there is evidence for *ne...not* being a distinct form. The redundant licensing model predicts that the frequency of *ne...not* is simply the product of independent and intersecting distributions of *ne* and *not*. It seems to me that the observed instances of *ne...not* should be excluded from the model so that the estimate of *ne...not* is only based on clauses in which we can see that *ne* and *not* are independent of each other. This has the advantage that it makes the estimated frequency of *ne...not* totally independent of the actual incidence of *ne...not* in the data.

If *ne* and *not* are truly syntactically independent as Frisch claims, this more restricted calculation should yield appropriate estimates for the frequency of *ne...not* in each period. Excluding the observed instances of *ne...not* from the model should make no difference to the results because Frisch assumes that *ne* and *not* are distributed in exactly the same way within NegP whether they co-occur or not. This underpins his assumption that the distributions of *ne* and *not* are independent. Any differences between the two models which include and exclude *ne...not* from the calculation would indicate that *ne...not* is not simply produced by the intersection of its component parts (*ne* and *not*) independently of each other.

Table 7 reports the results of basing the redundant licensing model to a restricted dataset which includes only *ne* and *not* which appear independently of each other, excluding *ne...not* from the model.

When we test the model using only the frequencies of *ne* and *not* which appear independently of each other (in Table 7) the model fails in all periods. The estimates for *ne...not* based on these data are several orders of magnitude lower than both the actual

⁵My thanks to an anonymous reviewer for pointing out this problem with Frisch's model. However, all the following comments are mine, and I accept full responsibility for any errors or misunderstandings.

Period	ne	not	Total Total	Estimated <i>ne...not</i> (%)	Observed <i>ne...not</i> (%)
1150-1250	436 (98.4%)	7 (1.6%)	443	1.6%	38.5%
1250-1350	166 (70.9%)	68 (29.1%)	234	20.6%	67.7%
1350-1420	43 (2.1%)	1959 (97.9%)	2002	2.1%	10.5%
1420-1500	14 (0.8%)	1842 (99.2%)	1856	0.7%	1.0%

Table 7: The model of *ne...not* as redundant licensing compared with the observed frequency of *ne...not*, following Frisch (1997, 51ff). Main and subordinate clauses from the PPCME2 with observed *ne...not* excluded from the model.

observed frequencies and the estimates generated when *ne...not* is included in the model (compare the figures in Table 7 with those in Table 4).

This finding is problematic for Frisch’s model. If *ne* and *not* were truly independent, and distributed in exactly the same way when they co-occur as when they do not, the estimate of *ne...not* should be an equally good fit, even when we count only *ne* and *not* which are independent of each other, when they negate a clause on their own. Instead, these results indicate that the observed distribution of *ne...not* is not derivable from the distribution of *ne* and *not*, when the observed instances of *ne...not* are excluded from the model. So it seems that Frisch’s model relies for its good fit on the inclusion of clauses in which *ne* and *not* co-occur (as *ne...not*). This finding questions the premise of the redundant licensing model, that *ne* and *not* are truly independent. We cannot replicate Frisch’s success using only *ne* and *not* which are unequivocally independent of each other in the data.

5 Quantitative evidence for two types of *ne*: the distribution of *ne* in Middle English

The previous section outlined two of the problems with the analysis of Jespersen’s Cycle as two independent morphological changes. This section examines quantitative evidence for an account of Jespersen’s Cycle as a morphosyntactic change (as proposed in section 2.2). Recall that the account I proposed of Jespersen’s Cycle as a morphosyntactic change involves two types of *ne* distinct in morphosyntactic features. I examine distributional evidence to differentiate the two types of *ne* in quantitative data from the PPCME2. Statistical analysis shows different constraints on the introduction of the two different types of *ne*.

The purpose of the quantitative analysis presented here is to find empirical evidence

within the database to distinguish two forms of *ne* at stages one and two of Jespersen's Cycle. Under a feature-based account (see section 2.2), stage one *ne* has a negative value at LF. Stage two *ne*, which co-occurs with *not* does not. In clauses which have both *ne* and *not*, it is *not* which has a negative value at LF. So the two forms of *ne* are morphosyntactically distinct and should exhibit independent distributions in the database.

In order to examine whether there is any distributional evidence for this distinction in the database, I will examine the distribution of both types of *ne* across contexts in which the use of *ne*, *ne...not* and *not* varies. Jack (1978) identifies certain subordinate clause types in which *ne* is more frequent in Late Middle English. These include subjunctive or conditional clauses (18) and clauses within the scope of negation (19). So, I will concentrate on the distribution of *ne* in these clause types.

1. In conditional clauses introduced by *if*:

- (18) if he ne hadde pitee of mannes soule, a sory song we myghten alle
 if he NEG had pity on a man's soul, a sorry song we might all
 synge
 sing
 'if he didn't take pity on a man's soul, we might all sing a sorry song'
 (CMCTPARS,296.C2a.343)

2. *That*-clauses within the scope of a negative. Here, scope in terms of the C-command relation, so that these clauses are C-commanded by a negative element.

- (19) "it may nat be," seith he, "that where greet fyr hath longe tyme endured,
 "it may not be," said he, "that where great fire has long time endured
 that ther ne dwelleth som vapour of warmness."
 that ther NEG dwells some vapour of warmness."
 ' "it may not be," he said "that where a great fire has been for a long time
 that it isn't warm there" '
 (CMCTMELI,223.C2.269)

Given Jack's observations, it seems sensible that the quantitative analysis should distinguish main clauses and subordinate clauses. Conditional clauses (18) and clauses within the scope of negation (19) should be further distinguished from other kinds of subordinate clauses where there exist sufficient data to do so.

An account which distinguishes two types of *ne* makes a simple prediction: if there are two forms of *ne* involved in Jespersen's Cycle this should become apparent from different patterns of variation and change involving each form. If there is only one form of *ne* then

ne should be distributed in exactly the same way throughout all the data, both when it occurs alone and when it co-occurs with *not*. The frequencies of clauses negated by *ne* (stage one) and *ne...not* (stage two) will be considered separately to establish whether *ne* is distributed the same way in each clause type at stages one and two of Jespersen's Cycle. Four clause types will be distinguished in the analysis: main clauses, subordinate clauses, *if*-clauses and clauses within the scope of negation.

In each clause type, the frequency of each form of *ne* is calculated not as a proportion of the total database, but only against negative clauses which do not contain *ne*. This makes the two forms of *ne* totally independent of each other within the analysis. The quantitative examination of clauses with stage one *ne* does not involve clauses with stage two *ne...not* and vice versa. This total separation of the two forms of *ne* within the analysis gives a much clearer picture of the constraints which operate on each form within the database and the differences between them.

5.1 The distribution of *ne* at stage one of Jespersen's Cycle

We see that stage one *ne* is more frequent in subordinate clauses than main clauses. It is much more frequent in clauses within the scope of negation than in the other clause types (Table 9).

Period	Main clauses				Subordinate clauses			
	<i>ne</i>	<i>not</i>	total	% <i>ne</i>	<i>ne</i>	<i>not</i>	total	% <i>ne</i>
1150-1250	91	3	94	96.8%	279	4	283	98.5%
1250-1350	48	48	96	50.0%	87	15	102	85.3%
1350-1420	3	935	938	0.3%	17	905	922	1.8%
1420-1500	1	927	928	0.1%	7	821	828	0.8%

Table 8: The frequency of stage one *ne* in main and subordinate clauses.

Period	<i>if</i> -clauses				In scope of negation			
	<i>ne</i>	<i>not</i>	total	% <i>ne</i>	<i>ne</i>	<i>not</i>	total	% <i>ne</i>
1150-1250	33	0	33	100%	33	0	33	100.0%
1250-1350	12	3	15	83.3%	19	2	21	90.5%
1350-1420	9	64	73	12.3%	14	55	69	20.3%
1420-1500	2	51	53	3.8%	4	43	47	8.5%

Table 9: The frequency of stage one *ne* in *if*-clauses and clauses within the scope of negation.

These data indicate differences in the frequency of stage one *ne* in the different clause types under investigation. Stage one *ne* is most common in *if*-clauses and clauses within

the scope of negation, than in other subordinate clauses. In turn, stage one *ne* is more common in all subordinate clause types than it is in main clauses. These differences appear highly consistent across the four periods, and indicate that the distribution of *ne* at stage one of Jespersen's Cycle is conditioned by clause type.

Tables 8 and 9 indicates that clause type has an effect on the distribution of *ne* at all periods, but it does not show whether the effect is the same across all periods, or whether there are differences in the effect which clause type has at different periods which need to be examined further. Tables 8 and 9 indicates that both 'clause type' and 'period' have an effect on the frequency of stage one *ne*. It is more common in subordinate clauses, especially *if*-clauses and clauses within the scope of negation. It is also more common in earlier than later periods, indicating a change in progress during Middle English.

So the figures in Table 8 and 9 are the product of the interaction of two factors which affect the variation between *ne* or *not* in different ways: clause type and period. The numbers give us no way of seeing the effect of 'clause type' on its own, independently of diachronic change. However informative these raw data are, they do not give us any way of comparing the way in which clause type conditions the distribution of *ne* across the four periods of Middle English, because of change in the frequency of stage one *ne* over time.

In order to work out whether the effect of clause type is the same at all periods throughout Middle English and therefore independent of diachronic change, we need to find a way of looking at the influence of clause type on the variation independently of the influence which 'period' has on the same data. For each period, we need a way to find out the extent to which a clause's being of a particular type will influence the choice of negation in that clause, *ne* or *not*, irrespective of the changing frequency of *ne* across time. This will allow us to compare the effects of clause type across the periods and allow us to see whether the effect of clause type changes over time, or whether it is constant even though the overall frequency of *ne* is changing.

Multivariate analysis provides a means to see whether the effect of clause type is the same at different periods during the change. Although both clause type and period affect the overall frequencies seen in the data, multivariate analysis makes a statistical estimate of the contribution which clause type and period each make to the distribution of *ne*. It can unpick the effects of both period and clause type statistically. It does this by estimating the likelihood that where a clause is negated by *ne*, that clause will be a main clause, a subordinate clause, an *if* clause or a clause in the scope of negation. Hence these likelihoods abstract away from the actual overall frequency of *ne* in a particular period. The likelihood of a clauses involving *ne* being of a particular type is relative to the likelihood

of it being each of the other clause types, not relative to the overall frequency of *ne* at a given period.

The probability is reported numerically as a probabilistic weight, allowing us to rank each clause type according to the likelihood that *ne* will occur in that clause type. This probabilistic weight tells us which clause types *ne* is most and least likely to occur in, irrespective of the overall amount of *ne* present in the data at a particular period. The larger the probabilistic weight associated with a particular clause type, the more likely *ne* is in that clause type.

By isolating the effect of clause type from that of period statistically, multivariate analysis makes it possible to compare the effect of clause type on the distribution of *ne* across all periods of Middle English. We can compare the data from different periods, to see if the effect of clause type on the distribution of stage one *ne* is the same throughout Middle English, by comparing the probabilistic weights for clause types in analyses of data from different periods. If clause type has a consistent effect on the distribution of stage one *ne*, the probabilistic weights associated with each clause type should be the same in all periods. This would show that the likelihood of *ne* appearing in a particular clause type is the same irrespective of the different amounts of *ne* present at different periods of Middle English.

Bulding on this, multivariate analysis provides a way to establish whether the loss of stage one *ne* observes the Constant Rate Hypothesis (Kroch, 1989) throughout all periods. If it does, then we can conclude that the same single change is responsible for the loss of stage one *ne* at all periods. The Constant Rate Hypothesis states that in a period of diachronic change, the rate of change is the same in all contexts where the change occurs. Kroch (1989, 206) states:

...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. This equivalence holds because, in statistical terms, the constant rate hypothesis is the claim that the overall rate of use of a form is independent of the contextual effects on its use.

(Kroch, 1989, 206)

We can state the Constant Rate Hypothesis in a different way: that in each context where change occurs (such the four clause types examined here) the probabilistic weights for each context should be the same throughout the change. When the probabilistic weights for each context are the same throughout a change, it demonstrates that the effect of each

context on the variation is independent of the change itself. The rate of change is therefore constant across all contexts, because it is independent of the contexts. The effect of each context measured as a probabilistic weight does not vary over time.

So we can hypothesise that the loss of stage one *ne* in Middle English is caused by a single change which follows the Constant Rate Hypothesis. We can test this hypothesis by examining the probabilistic weights for each clause type to see if these are consistent throughout all periods. If the probabilistic weights for the clause types are the same throughout Middle English, despite the gradual loss of *ne*, we can conclude that the loss of stage one *ne* is caused by a single change, and follows the Constant Rate Hypothesis.

Furthermore, using multivariate analysis, we can compare the effect of clause type on *ne* at stages one and two of Jespersen's Cycle. This allows us a way of determining whether stage one and stage two *ne* are the same or different entities. If they really are the same, they should be lost through the same change. Clause type should have the same effect on the distribution of *ne* at both stages one and two of Jespersen's Cycle, so the probabilistic weights for clause type should be the same for *ne* at both stages.

A brief description of the process of multivariate analysis and the design of the analysis may be useful here. Multivariate analysis quantifies the effect of a number of factors on an independent variable. In this case, the independent variable is the choice between *ne* and *not* which we have seen is variable throughout Middle English. The factors are those things whose influence on the linguistic variation we want to ascertain. Related factors are grouped together into factor groups, such as the group of clause types under investigation here. The factor group 'clause type' includes the factors main clause, subordinate clause, *if*-clause, clause in the scope of negation. These are the only factors included in the analysis here. Data from each period is analysed separately in order that the probabilistic weights for each clause type can be compared across the four periods.

In the periods 1350-1420 and 1420-1500, there are sufficient data to run multivariate analysis for all clause types: over 40 tokens for each clause type. The factor weights for *ne* in each clause type are quite consistent across the Late Middle English periods 1350-1420 and 1420-1500, for which there are most data (Table 10). In both these periods we see that main clauses consistently disfavour *ne* (have a low factor weight), whereas subordinate clauses consistently favour *ne* (have a high factor weight). *If*-clauses and clauses within the scope of negation have particularly high factor weights, showing that they strongly favour *ne*.

It was not possible to carry out multivariate analysis reliably on all contexts in the earlier periods 1150-1250 and 1250-1350 because of small numbers of tokens for some contexts. For the earliest period 1150-1250, there are no *if*-clauses or clauses in the scope

of negation without *ne*. These clause types could not be included in the multivariate analysis as they do not exhibit variation. Even for main and subordinate clauses in the period 1150-1250, multivariate analysis does not report statistically significant differences between the two clause types.⁶

For the period 1250-1350 we have only 15 *if*-clauses and 21 clauses within the scope of negation, making the results of multivariate analysis in these contexts unreliable. However in the period 1250-1350, we can at least see that the results of multivariate analysis for main and subordinate clauses are consistent with the results for the later periods, with main clauses disfavouring *ne* whilst subordinate clauses favour it.

Period	Input	Main cls	Sub cls	if-cls	Scope of neg	p
1250-1350	.712	.288	.701	–	–	.0001
1350-1420	.01	.250	.660	.936	.963	.0001
1420-1500	.003	.243	.717	.921	.965	.0001

Table 10: The results of multivariate analysis on the data in Table 8. Stage one *ne* is the independent variable, and clause type the only dependent variable within the analysis.

Table 10 shows that clause type has the same effect on the distribution of stage one *ne* in the periods 1250-1350, 1350-1420 and 1420-1500, and that the effect is statistically significant (note the very low p values). *If*-clauses and clauses in the scope of negation particularly disfavour *not* in Late Middle English. Although the factor weights for each context are not exactly the same in all periods, there is a large degree of consistency between the probabilistic weights for each context in the different periods. This is sufficient to claim that the loss of stage one *ne* fits the Constant Rate Hypothesis, and therefore, that the loss of stage one *ne* is a single change, at least from 1250 onwards.

5.2 The distribution of *ne* at stage two of Jespersen’s Cycle

This section compares the loss of stage two *ne* with the loss of stage one *ne* discussed above (section 5.1). This comparison provides empirical evidence to distinguish two types of *ne* at successive stages of Jespersen’s Cycle. Taking the same range of contexts found relevant to the distribution of stage one *ne* (see section 5.1), we see that these contexts have no effect on the distribution of stage two *ne* in any period.

⁶It is difficult to know what weight to give to this finding, and how to interpret it. There are very few clauses with *not* in this early period (n=3 in main clauses and n=4 in subordinate clauses) to differentiate the clause types within the analysis, so the lack of significance may be due to the overall scarcity of *not* in both clause types. However, it may be that *not* is behaving differently in the earlier period, or in texts from the western dialects which predominate in this period.

Tables 11 and 12 show the distribution of stage two *ne* and its frequency vis a vis clauses without *ne*. These tables distinguish main clauses, subordinate clauses and clauses within the scope of negation.

Period	Main clauses				Subordinate clauses			
	ne	not	Total	% ne	ne	not	Total	% ne
1150-1250	152	3	155	98.1%	112	4	116	96.6%
1250-1350	329	48	377	87.3%	147	15	162	90.7%
1350-1420	108	935	1043	10.4%	115	905	1020	8.9%
1420-1500	12	927	939	1.3%	4	821	825	0.5%

Table 11: The frequency of stage two *ne* in main and subordinate clauses from the PPCME2.

Period	if-clauses				In scope of negation			
	ne	not	Total	% ne	ne	not	Total	% ne
1150-1250	10	0	10	100%	3	0	3	100%
1250-1350	8	3	11	72.7%	6	2	8	75%
1350-1420	5	64	69	7.2%	8	55	63	12.7%
1420-1500	1	51	52	1.9%	1	43	44	2.3%

Table 12: The frequency of stage two *ne* in *if*-clauses and clauses within the scope of negation from the PPCME2.

The lack of contextual conditioning on the loss of stage two *ne* in clauses with *not* is most clearly shown by comparing its frequency in main and subordinate clause contexts, for which there are most data. Differences between the frequency of stage two *ne* in these two clause types are not significant for any of the four Middle English periods. Multivariate analysis was carried out on the data in Table 11 with the presence of absence of stage two *ne* as the independent variable, and clause type as the dependent variable. No other factor groups were included in the analysis. This analysis corroborates the idea that the loss of stage two *ne* is not conditioned by clause type. Clause types which were highly significant factors affecting the frequency of stage one *ne* are not significant under multivariate analysis for the distribution of stage two *ne* at any period of Middle English. The likelihood that stage two *ne* will appear in subordinate clauses is no different to the likelihood it will appear in main clauses.

Given the propensity of *if*-clauses and clauses in the scope of negation to use stage one *ne* until the late Middle English period which we identified in section 5.1, the number of these clauses involving other negatives, including stage two *ne...not* is necessarily small, particularly for the periods to 1350. Looking at Table 12 we see that the overall number of tokens in *if*-clauses of clauses within the scope of negation is less than 11 in each period.

So it is not possible to examine the distribution of stage two *ne* in these contexts using multivariate analysis for the periods 1150-1250 or 1250-1350.

However, in the periods 1350-1420 and 1420-1500 we find more than 40 tokens for each clause type, making multivariate analysis possible, to establish whether the distribution of stage two *ne* in *if*-clauses or clauses within the scope of negation is significantly different from its distribution in main or subordinate clauses. The analysis reports no differences between the clause types for either period 1350-1420 or 1420-1500, in marked contrast to the distribution of *ne* at stage one of Jespersen's Cycle.

5.3 Comparison of the distribution of stage one *ne* and stage two *ne* in quantitative data

The results of the previous two sections show marked differences between the distribution of *ne* at stages one and two of Jespersen's Cycle. Both the frequency data and multivariate analyses show that the likelihood of *ne* appearing in different clause types is significantly different at stage one of Jespersen's Cycle, but the same at stage two of Jespersen's Cycle. Subordinate clauses, especially *if*-clauses and clauses in the scope of negation, are most likely to involve *ne* at stage one of Jespersen's Cycle, but are no more likely than main clauses to involve *ne* at stage two of Jespersen's Cycle.

Clause type conditions the distribution of *ne* at the first stage of Jespersen's Cycle. Multivariate analysis reveals this factor to have a highly significant effect on the distribution of stage one *ne*. The consistency in the probabilistic weights associated with each clause type across the periods 1250-1350, 1350-1420 and 1420-1500 reveals that the effect of clause type on the distribution of stage one *ne* is systematic and consistent throughout these Middle English periods. This consistency in probabilistic weights over time fits Kroch's (1989) Constant Rate Hypothesis, and is unlikely to be accidental. It indicates that the loss of *ne* at stage one of Jespersen's Cycle is caused by the same change in all three periods 1250-1350, 1350-1420 and 1420-1500.

In contrast, *ne* at stage two of Jespersen's Cycle which negates a clause in combination with *not*, is distributed in the same way across all clause types. Under multivariate analysis, no clause type is statistically more likely to involve *ne* at stage two of Jespersen's Cycle than any other. Multivariate analysis does not report any statistically significant differences between the distribution of stage two *ne* in different clause types at any time during Middle English. The irrelevance of clause type to the distribution of *ne* at stage two of Jespersen's Cycle is consistent across all periods of Middle English.

So comparing the distributions of *ne* at stage one and stage two of Jespersen's Cycle,

we see marked differences at the two stages. These differences are consistent throughout Middle English and are difficult to account for unless we regard *ne* at stages one and two of Jespersen's Cycle as distinct forms. These findings support a model of Jespersen's Cycle which distinguishes *ne* at stage one and stage two of Jespersen's Cycle such as Rowlett (1998). This is the most straightforward way of accommodating the systematic and persistent distributional differences between the two forms. Postulating two forms allows them to be independent of each other, distributed in different ways and also lost independently of each other through different changes.

So I conclude that there are two distributionally distinct forms of *ne* involved in successive stages of the Middle English Jespersen's Cycle. This explains the poor fit of Frisch's (1997) model of Jespersen's Cycle to PPCME2 data. Frisch postulates a single form of *ne*, from which the frequency of *ne...not* at stage two of Jespersen's Cycle should be derived. So in this model, the distribution of *ne* at stages one and two should be the same, conditioned by clause type in the same way. For Frisch, the frequency of stage two *ne...not* should be higher in those clause types in which the frequency of stage one *ne* is higher, which it is not always. However, when we distinguish stage one *ne* from stage two *ne* we allow the distribution of each *ne* at stage one to be completely independent of *ne...not* at stage two.

6 Evidence for two types of *ne*: redundant negation

Further evidence to distinguish two forms of *ne* in Middle English comes from the redundant use of negatives during this period. Van der Wouden (1994, 107) defines redundant or paratactic negation as:

... various languages and dialects show the effect that a verb (or something else) of negative import triggers a superfluous negation in a subordinate clause.
(van der Wouden, 1994, 107)

Present Day English does not permit redundant negation, but it is attested in earlier stages of English following certain verbs of denial, prohibition or doubt (20-23). The data for this section are taken from the literature on redundant negation, principally van der Wurff (1999), and Baghdikian (1979), the *Oxford English Dictionary*, as well as the PPCME2. This increases the number of examples available to the analysis, to counteract the relative infrequency of redundant negation in the PPCME2 data. Care has been taken to count examples only once, even when an example appears in more than one source.

- (20) ðeah for eaðmodnesse wandiað ðæt hi hit ne sprecað
 yet for humility fear that they it NEG preach
 'yet for humility they fear to preach them'
 (CP 117.13)
- (21) Now sithen he deffendeth that man sholde nat yeven to his broother ne to
 Now hereafter he forbids that man should not give to his brother nor to
 his freend te myght of his body
 his friend the might of his body
 'Now, from now on he forbids man to give his brother or friend power over his
 body'
 (Chaucer, Melibee 1756).
- (22) You may deny that you were not the meane of my Lord Hastings late
 You may deny that you were not the means of my Lord Hastings late
 imprisonment
 imprisonment
 'You may deny that you were the means of my Lord Hastings late imprisonment'
 (Shakespeare, Richard III, I.ii.502-503)
- (23) Nature deffendeth and forbedeth by right that na man make hym self riche vn to
 Nature prohibits and forbids by right that no man make himself rich in to
 the harm of another persone
 the harm of another person
 'Nature prohibits and forbids by right that any man should make himself rich at
 the expense of another person'
 (Chaucer, Melibee, B. 2774)

6.1 Two types of redundant negation in Middle English

In this section, I argue that two types of redundant negation should be distinguished, in terms of their licensing contexts, in terms of the negatives which are used redundantly, and in terms of the period of productivity of each of the two patterns. In the complement clauses of predicates of denial or prohibition, redundant negation is attested with *ne* in Old English (24a) and Early Middle English (24b), and with *not* in Middle English (24c) and Early Modern English (24d).

- (24) a. ðeah for eaðmodnesse wandiað ðæt hi hit ne sprecað
 yet for humility fear that they it NEG preach
 'yet for humility they fear to preach them'
 (CP 117.13)

- b. Iesus hire þo for-bed þat heo attryne ne sceolde his hond ne his fet
 Jesus her though forbade that she bind ne ought his hands nor his feet
 'though Jesus forbade her to bind his hands or his feet
 (c. 1275 Passion 581 in OE Misc 53)
- c. he commandeth and forbedeth faste / Man shal not suffre his wife go
 he commands and forbids firmly / man shall not allow his wife to-go
 roule aboute
 gad about
 'The same proverb from Ecclesiastes, where he commands and forbids that
 men should allow their wives to gad about'
 (Chaucer Wife of Bath's Prologue 651ff, van der Wurff (1999,306))
- d. She silly Queene forbad the boy he should not passe those grounds
 She silly Queen forbade the boy he should not pass those grounds
 'She, silly Queen, forbade the boy to pass those grounds'
 (1599 Shaks, Pass Pilgr. 124)

In these examples, we see that the negative used redundantly is the predominant sentential negative marker of the time, *ne* in Old and Early Middle English, and *not* in Late Middle English.

However there is a second form of redundant negation. In Late Middle English, redundant *ne* appears in the complement clauses of predicates of doubt (25), but only when the main clause itself is negative.

- (25) a. ne doute the nat that alle thinges ne ben don aryght
 NEG doubt you not that all things ne are don rightfully
 'Do not doubt that all things are done rightfully'
 (Chaucer's Boethius IV P5,49)
- b. Ne thou doutest nat [...] that thilke naturel office of goinge ne be the
 Nor you doubt not [...] that the-same natural task of moving NEG be the
 office of feet?
 task of feet?
 Nor do you not doubt that the the same natural task of moving is the task of
 feet?
 (Boethius Bk. IV Pr.2)

Van der Wouden (1994, 113) observes a similar phenomenon in French. The French verb *doute* 'doubt' although not a licenser for redundant negation itself (26), may inherit the ability to license redundant negation when itself under negation (27).

- (26) Je doute fort que cela soit
 I doubt strongly that that be-(subjunctive)

'I seriously doubt that that should be'
(van der Wouden, 1994, ex.42a, 109)

- (27) Je ne doute point que la vraie dévotion ne soit la source du
I not doubt not that the true devotion not be-(subjunctive) the source of
repos
rest

'I do not doubt at all that devotion is the true source of rest.'
(van der Wouden, 1994, ex.55b, 113)

Middle English verbs of dubitation parallel their French counterparts. In Middle English, redundant negation only occurs with verbs of dubitation which are negated. It does not appear with verbs of dubitation which are not negated.

Only *ne* is used redundantly in the complement of negated predicates in Late Middle English. In contrast, elsewhere we find Late Middle English examples like (24c) with *not* used redundantly. So, in Late Middle English there are two contexts for redundant negation, distinguished by two different ways of marking redundant negation. In the complement clause of a negated predicate the redundant negative is *ne* (28). Other redundant negation contexts mark redundant negation using *not* (29).

- (28) no man douteth that he **ne** is strong in whom he seeth strength
no man doubts that he *ne* is strong in whom he sees strength
'No one doubts that that person is strong in whom he sees strength'.
(Chaucer Boece II, Pr.6, 93-4)

- (29) Now sithen he deffendeth that man sholde **nat** yeven to his broother ne to his
Now since he forbids that man should not give to his brother nor to his
freend te myght of his body
friend the might of his body
Now, since he forbids man to give his brother or friend power over his body'
(Chaucer, Melibee 1756)

Once *ne* is lost, redundant negation in the complement a negated predicate is also lost⁷ unlike redundant negation with verbs of prohibition or denial which continues to be

⁷One exception is noted by Baghdikian (1979) in Queen Elizabeth's version of the *Boethius* (i). This is a translation of a French original, so patterns of redundant negation in French may be responsible for the anomalous pattern we see here.

- (i) ...nor does not doute that it is not the feet's office
'...nor does not doubt that it is the feet's office'
(Queen Elizabeth's Boethius P2,38)

productive into the Early Modern English period with *not* (30).

- (30) You may deny that you were **not** the meane of my Lord Hastings late imprisonment

(Shakespeare, *Richard III*, I.iii.502-503, van der Wurff (1999, ex.14))

Comparison of Early Middle English redundant *ne* and Late Middle English redundant *ne* indicate a change in the distribution of *ne*. It comes to be restricted to negative contexts during the course of Middle English. The last example of *ne* I have found used redundantly following a non-negated predicate of prohibition or denial is c.1275 (24b). In contrast, when in the complement of a negated predicate of doubt, redundant *ne* is attested even in the Late Middle English of Chaucer.

The date of this change corresponds to the loss of stage one *ne* in sentential negation contexts. Hence we might try to link change in the distribution of redundant *ne* to the change which happens in sentential negation contexts. The effect of change in both contexts is the same: restriction of *ne* to contexts in which another negative is present. Hence we can make the descriptive generalisation that LME *ne* is only licensed in the scope of another negative. This licensing condition distinguishes it from EME *ne* at stage one of Jespersen's Cycle, whose distribution is not constrained by this condition.

Van der Wurff's (1999) account of redundant *ne* assumes a single form of *ne* throughout Middle English, and does not examine changes in the distribution of redundant *ne*. His account is based on the Neg-criterion (Haegeman, 1995). It uses a null operator in the complement clause of predicates he terms 'adversative predicates' (such as *deny, prohibit, forbid, doubt*) to license redundant *ne* by spec-head agreement between the operator and *ne* in the complement clause's NegP. The null operator is then selected by certain (adversative) predicates to give redundant *ne* with just those predicates. This analysis does not accommodate two of my findings: first that *not* is also used redundantly in the complement clauses of the same verbs of denial or prohibition in Late Middle English, and second that the licensing conditions on redundant *ne* change during Middle English. In Late Middle English, the licensing conditions on redundant *ne* are more specific than van der Wurff proposes. The main clause must be negative in order for redundant *ne* to appear in a dependent clause. So the main clause negation is implicated in licensing Late Middle English redundant *ne*, whilst it is not implicated in licensing Early Middle English redundant *ne*.

Each form of redundant *ne* is subject to different conditions on its distribution: one appears in the complement clauses of adversative predicates like 'forbid, prohibit' which are not negated, the other appears in negated predicates of doubt. These two forms have

different periods of productivity, which appear to parallel stage one and stage two of Jespersen's Cycle. In section 5, I presented evidence that these successive stages of Jespersen's Cycle involve two distributionally distinct forms of *ne*.

One possible analysis of Late Middle English *ne* is as a negative polarity item (NPI), both in its redundant uses and at stage two of Jespersen's Cycle. Van der Wouden (1994) proposes to account for redundant negation in the same way as negative polarity item (NPI) licensing. This captures the requirement that *ne* must be licensed by another negative which C-commands it.

However, the distribution which this analysis predicts for Late Middle English redundant *ne* is too generalised. It does not predict all the constraints which we find on the distribution of redundant *ne* in Late Middle English. Predicates of the type '*deny, prohibit, forbid*' can license NPIs in their complement clause. In contrast, these same predicates do not license Late Middle English redundant *ne* in their complements, unless they are themselves negated. These two observations argue against analysing redundant *ne* as a case of NPI licensing.

In the next section, I propose to unify the two forms of redundant *ne* with the two forms of *ne* involved in Jespersen's Cycle, making a morphosyntactic distinction between the two forms of *ne* within a feature-based syntactic model. I argue that the different licensing conditions are syntactic, and in fact follow from the fact that the two types of *ne* have different morphosyntactic features.

7 The syntactic distinction between two forms of *ne*

The results of the previous two sections provide clear distributional evidence to distinguish two forms of *ne* in Middle English, at stage one and stage two of Jespersen's Cycle. Section 5 presented evidence that the distribution of *ne* at stage one of Jespersen's Cycle is statistically distinct from its distribution at stage two. In section 6, we have seen evidence to make a distinction between two types of redundant *ne*, which closely parallels the distinction between the two forms involved in Jespersen's Cycle.

We can link both distinctions under a single descriptive generalisation. In both redundant and sentential negation contexts, Late Middle English *ne* must be licensed by another negative element, unlike Early Middle English *ne*. So we have two forms of *ne* with different licensing conditions at different times within the Middle English period.

In this section, I propose to unify these observations within a syntactic account based on a Minimalist implementation of the Principles and Parameters theory.

7.1 Theoretical assumptions within the Minimalist framework

The version of the Minimalist framework I adopt relies on morphosyntactic features to build syntactic structure and establish syntactic relations between lexical items. Chomsky (2000) distinguishes two types of morphosyntactic features according to the contribution they make to semantic interpretation at logical form (LF). Morphosyntactic features either have a semantic value which contributes to interpretation of the clause at LF, or they are unvalued and make no contribution to LF. The latter are formal features, present only to trigger certain syntactic operations. In section 7.2, I will consider whether this syntactic division of morphosyntactic features into two kinds correlates with the distinction between two forms of *ne* we observed in the historical data.

In Chomsky's system, semantically unvalued features must be eliminated from the clause's representation before semantic interpretation at LF takes place. This follows from his claim that unvalued features cannot be interpreted at LF. Any unvalued features which remain at LF will cause the semantic interpretation of the clause to fail because unvalued features lack any semantic value. Chomsky claims that the deletion of unvalued features involves syntactic agreement. An unvalued feature must be checked against and agree with a matching valued feature⁸ on another lexical item during the derivation, in order to be deleted. So the role of unvalued features is to establish syntactic relationships between lexical items, in a feature-checking operation, before unvalued features can be deleted.

This links the presence of LF unvalued features with agreement in the syntax. One example is subject-verb agreement for person and number. Person and number are marked on both subject nominals and finite verbs, with agreement between the subject and the verb. However, person and number are semantically interpreted as properties of the subject not of the verb. The subject has valued person and number features, whilst those on the verb are unvalued, hence the features of the verb must enter into agreement with the features of the subject. Agreement morphology is syntactically characterised by unvalued features on the verb.

7.2 An account of Jespersen's Cycle based on morphosyntactic features

The distinction between two types of morphosyntactic features, valued and unvalued, corresponds to the distinction between two types of *ne* we observed in the historical data. At stage one of Jespersen's Cycle *ne* has a negative value at LF. It does not enter into syn-

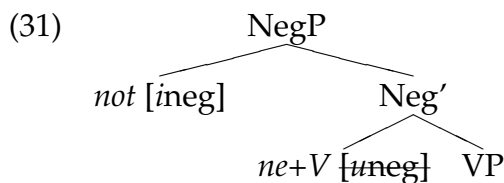
⁸Where a matching feature is of the same type, for instance polarity or force, not the same semantic value.

tactic agreement with any other negative element. However, at stage two of Jespersen’s Cycle, we find two negative morphemes *ne* and *not* co-occurring to give a sentential negation reading. Given that a negative clause must have only one negative value in its LF representation, only one of *ne* or *not* can have a negative value at LF. There must be syntactic agreement between the two negatives which ensures a sentential negation reading.

So we might analyse stage two *ne* as having an unvalued feature which requires agreement with *not*, in contrast to stage one *ne* which has a valued feature. The features on *ne* and *not* match in terms of their type: both are polarity or force features. At stage two of Jespersen’s Cycle, the unvalued feature on *ne* enters into an agreement relation with a valued feature on *not*. The agreement operation deletes the unvalued feature on *ne*, leaving only the valued negative feature of *not* for interpretation at LF. Unvalued features on functional heads represent agreement morphology which makes no contribution to the semantics. So we might think of *ne* at stage two of Jespersen’s Cycle as ‘negative agreement’, in contrast to stage one when *ne* introduces a negative value at LF.

We can adapt the feature-based account proposed by Zeijlstra (2004, 168) to accommodate these two distinct forms of *ne*. Zeijlstra (2004) proposes that feature checking in NegP is between an operator merged in specifier position with a valued negative feature and a head whose negative feature is unvalued. So we can simply parameterise this specifier-head agreement to hold only at stage two of Jespersen’s Cycle, when *not* bears a valued negative feature and functions as an operator. In contrast, at stage one, we can associate the valued negative feature with the head directly, eliminating the need for merge of an operator, or any specifier-head agreement within NegP at stage one of Jespersen’s Cycle.

The features of the head and the merged element are of the same type, differing only in value. Unvalued features on the head X^0 agree with valued features on the lexical item which is merged with the head. In the case of stage two of Jespersen’s Cycle, the unvalued polarity feature on Neg⁰ (*ne*) is valued by Merge of *not* with Neg⁰. Merge of *not* introduces negative features which are LF-valued. Hence *not* checks and deletes the unvalued polarity feature of Neg⁰. This results in (31) in which *ne* and *not* are sisters, where [*ineg*] is the valued negative feature and [*uneg*] is the unvalued negative feature). Checked and deleted features are struck through (~~uneg~~).



It follows from this analysis that the Neg-criterion is parametrised as an agreement relation based on feature checking, and does not operate at stage one of Jespersen’s Cy-

cle, as in Rowlett's (1998) account. This has important implications for the status of the functional projection NegP. At stage two of Jespersen's Cycle, Neg⁰ has only unvalued features, much like Agr⁰ in the early Minimalist Program (Chomsky, 1995). The status of such projections has been debated in the syntactic literature, for example see Chomsky (2000) and Nash and Rouveret (1997) for different approaches. The distribution of *ne* at both stages one and two of Jespersen's Cycle is that of a verbal clitic, so the question of NegP is a question about the circumstances a verbal clitic projects a functional head in the syntax. Nash and Rouveret (1997) allow unvalued features to project in order to provide syntactic positions for feature checking to take place (in what we would call a specifier-head configuration in X'-theory). However, Chomsky (2000) argues that functional projections headed by unvalued features cannot exist. At stage two of Jespersen's Cycle this approach prohibits NegP. It requires that *ne* is not an independent functional head but part of another head such as V⁰.

The agreement underlying Late Middle English redundant *ne* is more complex than (31). Instead of a configuration like (31), *not* and *ne* appear in different clauses. Again, *ne* does not appear to contribute negative features at LF, but agrees with *not* in a main clause. So long-distance agreement is required to license redundant *ne* in the subordinate clause.

Chomsky proposes a system of long-distance agreement which is subject to locality constraints and is based on one-to-one matching. An unvalued feature agrees with the closest matching valued feature it C-commands. Chomsky's (2000) approach to long-distance agreement is problematic for an account of Late Middle English redundant *ne* if *ne* has an unvalued polarity feature. Whilst Agree requires an unvalued feature to C-command a valued feature, the configuration involving redundant *ne* is the other way around. The valued feature on main clause *not* C-commands and agrees with an unvalued feature on *ne* in the dependent clause. So in Chomsky's system, it is not clear how the unvalued feature of redundant *ne* is ever valued by agreement with *not*.

However, we can extend the feature-based analysis Zeijlstra (2004) proposes for multiple negation to deal with redundant *ne* licensing. This system of long-distance agreement does not rely on one to one matching of features within a C-command relationship, but allows multiple agreement between all matching features within a syntactic domain. In certain cases, the syntactic domain over which agreement holds is larger than a single clause. Multiple negation involving negative quantifiers or negative adverbs is not always clause bound (Ukaji, 1999; Zeijlstra, 2004), but can involve agreement between a negative in a main clause and a negative in non-assertive dependent clauses (33). This is what I will call wide scope multiple negation, following Ukaji (1999). Late Middle English redundant *ne* and multiple negation are subject to the same kind of locality constraints.

Both the restriction of Late Middle English redundant negation to non-assertive dependent clauses and the configuration of negative elements in Late Middle English negation find parallels in wide scope multiple negation. In both, the negative in the dependent clause does not contribute negation to the interpretation of the clause at LF, but agrees with a negative in the main clause which C-commands it. These parallels between redundant *ne* (32) and what I will call wide scope multiple negation (33) support the same analysis of the two phenomena.

(32) *ne doute the nat that alle thinges ne ben don aryght*
 NEG doubt you not that all things ne are don rightfully
 ‘Do not doubt that all things are done rightfully’
 (Chaucer’s *Boethius* IV P5,49)

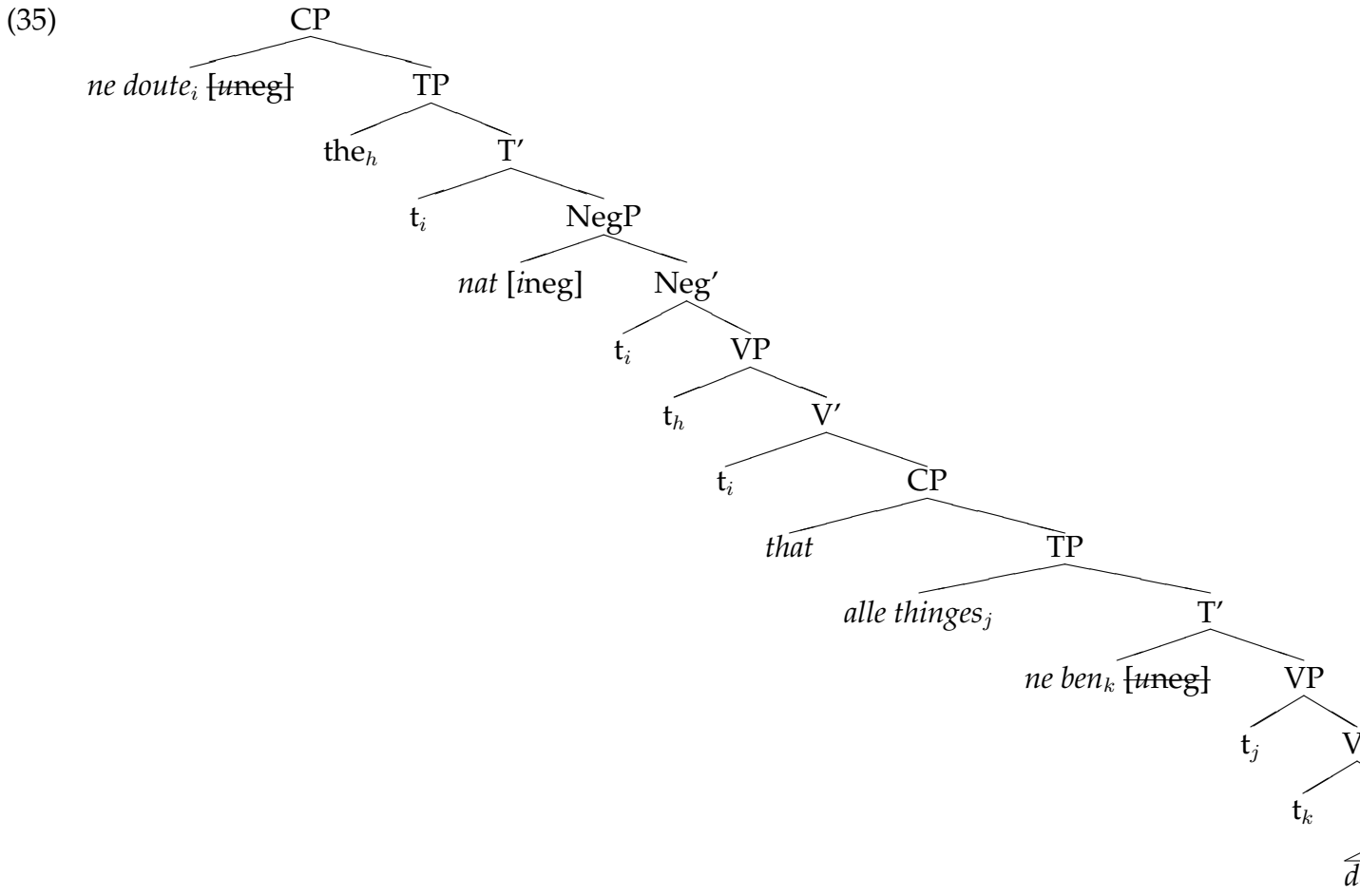
(33) *And with-owt he wole restore that, I trowe no man can think that his trete is to*
And without he will restore that, I believe no man can think that his threat is to
no good purpose
no good purpose
 ‘And unless he will not restore that, I believe no man can think that his threat is to
 any good purpose’
 (1450, *Paston Letters* 39.51-51, (Ukaji, 1999, 273). My gloss and translation)

So, we can adopt a feature checking configuration for Late Middle English redundant *ne* licensing similar to the one Zeijlstra (2004) uses to account for wide scope multiple negation. The configuration Zeijlstra (2004) adopts is multiple agreement based on Hiraiwa (2001), in which agreement between a single valued feature and all matching unvalued features in the same syntactic domain holds simultaneously. So in (32) merge of *not* in the main clause’s NegP to check the features of Neg⁰ will value all matching unvalued features including the one on redundant *ne* in the dependent clause.⁹ Crucially, for redundant *ne* to be licensed, the local syntactic domain must include both the main clause and its dependent clause. The dependent CP must lack any force features of its own which would block agreement between main clause negation and redundant *ne* in the dependent clause. The restriction of Late Middle English redundant *ne* to non-assertive dependent clauses follows from this. Non-assertive clauses lack force features in their CP.

⁹In (32) the main clause Neg⁰ is morphologically overt *ne*. This is not the case in all clauses which license Late Middle English redundant *ne*. What we need to say in these main clauses without *ne* is that the morphosyntactic features of Neg⁰ are the same, requiring valuation by agreement, but that Neg⁰ has no morphological realisation.

(35) illustrates a partial structure associated with (34), up to the point in the derivation where the main clause NegP is formed.

- (34) *ne doute the nat that alle thinges ne ben don aryght*
 NEG doubt you not that all things ne are don rightfully
 'Do not doubt that all things are done rightfully'
 (Chaucer's Boethius IV P5,49)



I make parallel the analysis of Late Middle English redundant *ne* and wide scope multiple negation, adopting Zeijlstra's (2004) analysis of wide scope negation. Using this analysis, we can maintain that the distinguishing feature of Late Middle English redundant *ne* is that it has an unvalued polarity feature, just like *ne* at stage two of Jespersen's Cycle. The fact that Late Middle English *ne* appears in multiple negation with *not*, both when *ne* is used redundantly, and at stage two of Jespersen's Cycle, indicates that it has the unvalued negative feature required for agreement with *not*. This feature can be checked by agreement with *not* in two different ways according to whether *ne* is a sentential negative at stage two of Jespersen's Cycle is is used redundantly. In contrast,

at stage one of Jespersen's Cycle *ne* has a valued [ineg] feature, so does not require agreement with any other negatives. This explains why *ne* can negate a clause on its own in Early Middle English, and why the distribution of *ne* is different in Early and Late Middle English.

8 Conclusion

Kroch's (1989, fn.26, 262) prediction that '...it may be possible to choose between grammars proposed on the basis of synchronic analysis by the predictions they make as to which contexts should change together.' provides a new perspective on the syntactic representation of negation in Middle English. Syntactic analyses of Jespersen's Cycle make different predictions concerning patterns of variation in diachronic data. Therefore, statistical analysis of variation in diachronic data allows two different syntactic analyses to be evaluated.

Syntactic accounts of Jespersen's Cycle differ according to whether they distinguish stage two *ne* from stage one *ne*. The Neg-criterion approach, and the Minimalist analyses by Roberts and Roussou (2003) and Zeijlstra (2004) identify Jespersen's Cycle as a morphological change in the realisation of syntactically invariant positions associated with negation. These accounts all posit a single lexical item *ne* which represents the negative head position at both stage one and two. However, Rowlett (1998) proposes an account of Jespersen's Cycle as a morphosyntactic change which assigns different morphosyntactic features to *ne* at stage one and stage two of Jespersen's Cycle. More recent Minimalist frameworks such as Chomsky (2000) also make it possible to distinguish *ne* at stages one and two of the cycle. Under Chomsky's (2000) framework, we can associate morphosyntactic features which differ in their semantic values with *ne* at successive stages of Jespersen's Cycle.

Patterns of variation and change in Middle English data allow these two groups of analyses to be evaluated, by examining whether the distribution of *ne* is the same throughout Middle English, or whether its distribution is the same or different at stages one and two of Jespersen's Cycle. The quantitative data presented in section 5 are evidence that the distribution of *ne* is different at stages one and two of Jespersen's Cycle. At stage one, we find different frequencies of *ne* in different types of clauses.

The frequency of *ne* differs according to the type of clause which is negated. Statistical analysis reveals that the effect of clause type on the distribution of *ne* at stage one is both highly significant and consistent throughout Middle English. In contrast, clause type does not have any significant effect on the frequency of *ne* at stage two of Jespersen's Cycle at

any time during Middle English. These findings are evidence that stage one *ne* and stage two *ne* are distributionally independent, and need to be distinguished both within models of change and in syntactic models.

More evidence to distinguish two types of *ne* comes from a change in the distribution of redundant *ne* during Middle English. In the Late Middle English data I have examined, redundant *ne* only occurs within the scope of a main clause negation. This restriction does not apply to Old English and Early Middle English redundant *ne*. In Late Middle English redundant *ne* must be licensed by agreement with another negative. There are parallels between *ne...not* at stage two of Jespersen's Cycle and Late Middle English redundant negation which suggest that the two are linked. Both are productive at similar times, emerging and disappearing concurrently and both involve agreement between negative elements.

So the Middle English data require two forms of *ne* which are distributionally distinct and which exhibit different syntactic behaviour. In line with the evidence presented here, a Minimalist account allows us to distinguish two forms of *ne* which differ only in the value of a single morphosyntactic feature. At stage one, *ne* has a valued negative feature. At stage two, *ne* has an unvalued negative feature. The co-occurrence of *ne* and *not* at stage two of the cycle follows from this difference. At stage two, *ne* enters into an agreement relationship with *not* in order to check and delete its unvalued negative feature. I propose that Late Middle English redundant *ne* has the same unvalued negative feature, hence the requirement for Late Middle English redundant *ne* to appear in agreement with another negative. Using agreement mechanisms which have already been proposed in the literature, it is possible to derive both agreement between *ne* and *not* at stage two of Jespersen's Cycle and the licensing conditions on Late Middle English redundant *ne*.

These findings support a syntactic account of Jespersen's Cycle as a morphosyntactic change, involving the innovation of a feature checking dependency between *ne* and *not* at stage two of the cycle. The Neg-criterion is recast as a feature-checking dependency and parametrised so that it does not hold at stage one of Jespersen's Cycle. An account based on change in the value of morphosyntactic features allows a much finer syntactic distinction to be made between the different stages of Jespersen's Cycle than is possible in syntactic accounts based only on categories and positions within X'-theory. There are no reasons to suppose that *ne* is either categorially different or occupies a different position within clause structure at stages one and two of Jespersen's Cycle, yet there are important differences between the distribution of *ne* at these two stages. These are difficult to formulate in terms of categories or positions, but can be captured by a Minimalist account based on morphosyntactic features. Empirical observation of both the syntactic

behaviour of *ne* and its distribution during a period of variability and diachronic change in English provides crucial evidence to inform the syntactic analysis. So patterns of variation and change in Middle English data support a morphosyntactic feature based account of Jespersen's Cycle.

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