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The Loss of Negative Concord with Negative PPs¹

Abstract: Middle English loses the negative particle *ne* in its function as a sentential negator as well as in negative concord structures. This paper measures *ne*-drop in both contexts with quantitative data from three syntactically parsed Middle English corpora. Surprisingly, the results show that the rate of *ne*-loss with negative prepositional phrases (PPs) seems to be significantly slower than elsewhere. Different explanations for this observation are explored. It is argued that the predominant reason for this differential behaviour lies in one particular type of negative PP – those usually taking bare quantifier complements and denoting ‘nothingness.’ These phrases do not take clausal scope and hence never occur with *ne*. Future studies should control for the presence of this type of negative PP to avoid over-inflation of the category of *ne*-free negative clauses.

Keywords: Middle English negation, negative concord, Jespersen Cycle, negative PPs, parsed corpora, regression modelling

1. Introduction: The Loss of *Ne*

Middle English inherits the negative particle *ne* from Old English, in fact from ancestral language stages going back all the way to Proto-Indo-European (e.g., Malory – Adams 2006: 422). During the Middle English period, however, this item is in decline and eventually disappears. It is possible to identify two distinct environments for this loss.

First, the particle *ne* disappears in its function as sentential negation (SN). Specifically, Middle English executes the Jespersen Cycle, a gradual change in SN from a single negative particle, *ne*, (Stage I, (1a)), through co-occurrence of *ne* and the negative adverb *not*, (Stage II, (1b)), towards exponence of *not* alone

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(Stage III, (1c)) (e.g., Jespersen 1917, Mitchell 1985: § 1603, Frisch 1997, Wallage 2008, Wallage 2017: chapter 5).

- (1) Disappearance of *ne* as SN
- a. *he ne sculde beon ded*
 he not should be dead
 ‘He should not be dead’ (*Layamon’s Brut*, c. 1200)
- b. *He ne shal nouȝt sechen.*
 he not shall not seek
 ‘He shall not seek’ (*Earliest Prose Psalter*, c. 1350)
- c. *They Ø² shall not mysse*
 they shall not miss
 ‘They shall not miss’ (*A right merrie Comedie*, c. 1570)

Second, the particle *ne* also disappears from Negative Concord (NC) structures. In this paper, NC is defined as the co-occurrence of the negative particle *ne* with another negative element other than *not* to express a single logical negation. For example, *ne* can co-occur with a negative adverb, (2), a negatively quantified object (3), or a negatively coordinated subject, (4) (e.g., Jack 1978, Iyeiri 1999). It is then dropped, leaving a single negative element behind. The resulting structure lets negation from the remaining negative element scope over the entire clause in lieu of SN. This is still a grammatical option in Modern English (modulo other linguistic changes).

- (2) Disappearance of *ne* in NC with negative adverbials
- a. *And þo .ij. sterres ne meeven neuere*
 and those two stars not move never
 ‘And those two stars never move’ (*Mandeville’s Travels*, c. 1371)
- b. *for þey Ø synned neuere*
 for they sinned never
 ‘because they never sinned’ (*Wycliffe Sermons*, c. 1383)

2 The null symbol Ø highlights throughout this paper the absence of the negative particle *ne*. A theoretical analysis or commitment to an empty element is not thereby implied.

- (3) Disappearance of *ne* in NC with negative objects
- a. *they no haveth [no joye]*
 they not have no joy
 ‘They have no joy’ (*Alisaunder*, c. 1300)
- b. *On hyme ze Ø had [no mercy]*
 on him you had no mercy
 ‘You had no mercy on him’ (*Siege of Jerusalem*, c. 1500)
- (4) Disappearance of *ne* in NC with negative subjects
- a. [*cayser no kyng*] **No** may withstonde *Godis helpyng!*
 Caesar nor king not may withstand God’s helping
 ‘neither Caesar nor king may withstand God’s helping’ (*Alisaunder*, c. 1300)
- b. [*no fur. ne hete*] *ney me Ø com*
 no fire nor heat nigh me came
 ‘neither fire nor heat came near me’ (*South English Legendary*, c. 1265)

NC can also be formed with more than one negative element (not counting *ne*). I will refer to such structures as multiple negative concord (multiple NC). Once again, Middle English witnesses the gradual disappearance of *ne* from such constructions, as illustrated in (5) for multiple NC with both a negative adverb as well as a negatively coordinated subject. Cases of multiple NC without *ne* are therefore best thought of as remnants after *ne*-drop has taken place.³

3 Scholars do not always conceptualise multiple NC without *ne* as a leftover from an original construction that did involve the negative particle *ne*. Instead, they treat the structure as a primitive of investigation in its own right, especially as a variant in the spread of negative polarity items (NPIs) roughly between the fifteenth and eighteenth century (e.g., Nevalainen 2006, Ingham 2006, Kallel 2007), as illustrated in (i).

(i) Development after the loss of *ne*: From multiple NC without *ne* to NPIs

a. [**No** *man*] *make [none congregaciouns]*
 no man make no congregations

‘Nobody should hold any congregations’ (*Brembre I*, 1384, Ingham 2006 ex. 6)

b. [**No** *mannes cursynge*] *hath [ony strengthe]*
 no man’s cursing has any strength

‘Nobody’s cursing has any strength’ (*Wyclif tracts*, c. 1380, Ingham 2006 ex. 11)

These scholars assign the label NC exclusively to structures such as (ia) or (4a), whereas the present paper views those as special cases of NC (i.e., multiple NC without *ne*) and

- (5) Disappearance of *ne* in multiple NC
- a. [*neither* God *ne* man] *ne* sholde *nevere* knowe it.
Neither God nor man not should never know it
'Neither God nor man should ever know it' (*The Parson's Tale*, c. 1390)
 - b. [*nouther* the kyng of Ermonyne *Ne* the contree] \emptyset weren *neuer* in pees
neither the king of Ermonyne Nor the country were never in peace
'Neither the king of Ermonyne nor his country were ever at peace'
(*Mandeville's Travels*, c. 1371)

There is a close relation between the drop of *ne* in SN and NC. Nevertheless, it makes sense to distinguish the two patterns. (a) Step I of Jespersen's Cycle only makes sense for SN, not for NC. (b) Theoretical analyses of the two phenomena usually assign to them two distinct semantic representations, SN being a relatively simple operation inverting the truth conditions of a proposition, NC involving more complex semantic types (e.g., Zeijstra 2004: chapter 8). (c) SN does not develop negative polarity items (NPIs) as an additional variant of negation whereas NC does. (d) Finally, the patterns described by SN and NC hardly ever overlap in the sense that if *ne* co-occurs with *not* it does not usually also co-occur with another negative element (e.g., Laing 2002).

This paper focuses on one particular form of Middle English NC that has so far received relatively little attention in the literature, namely NC with negative prepositional phrases (PPs). Unsurprisingly, *ne* is lost in this context, too. Illustrations are presented for negative adjunct PPs (i.e., elements intuitively classified as optional modifiers) in (6) and negative complement PPs (i.e., elements intuitively categorised as non-optional arguments) in (7).

- (6) Disappearance of *ne* in NC with negative PPs
- a. he *ne* mihte cysten þærof [_{pp}for *nan* þing] twelfe penegas.
he not might cost thereof for no thing twelve pennies
'he could not even get twelve pennies for it in any way' (*Peterborough Chronicle*, c. 1125)

uses the term NC more liberally for all occurrences of multiple negative elements other than *ne ... not*, as in (2), (3), (4), (5) etc.

- b. &sch; sche Ø wolde [_{pp} in no wise] gon thens
 and she would in no wise go thence
 ‘and she would absolutely not depart from there’ (*Book of Margery Kempe*, c. 1438)
- (7) a. þey ne recche [_{pp} of no ryzt fey]
 they not care of no right faith
 ‘They do not care about the right faith’ (*Handling Sin*, c. 1303)
- b. þei Ø recche [_{pp} of no schame]
 they care of no shame
 ‘They do not care about shame’ (*Temporale Sermon cycle*, c. 1420)

It is possible to measure and quantify the speed with which *ne* is lost in the SN and NC patterns illustrated in (1)–(7). When such an investigation is conducted, the results show a surprising divergence: The negative particle *ne* is seemingly lost substantially more slowly with negative PPs than elsewhere. Specifically, there are on average more negative PPs without the negative particle *ne* than would be expected given a particular time point. Section 2 presents the corpus-based study that leads to this observation.

The remainder of the paper will then investigate reasons for this *prima facie* unexpected behaviour of NC with negative PPs. Specifically, Section 3 pursues three avenues towards potential explanations: measurement errors, the argument – adjunct distinction, and semantic differences. Section 4 concludes.

2. A Measurement of the Loss of *Ne*

This section reports the observation that the loss of *ne* in NC structures with negative PPs seems to proceed surprisingly slowly. First, the data collection process will be described. Subsequently, the resulting dataset will be described, and a mixed-effects logistic regression model will be fit to the data as a convenient way to summarise the development. I will also offer some important implications of the findings for related research.

2.1. Data Collection

The data for this study come from three syntactically parsed and annotated corpora of Middle English, the *Penn-Parsed Corpus of Middle English*, 2nd edition (PPCME2, Kroch – Taylor 2000), the *Parsed Corpus of Middle English Poetry* (PCMEP, Zimmermann 2015) and the *Parsed Linguistic Atlas of Early Middle English* (PLAEME, Truswell *et al.* 2019). In total, the data basis consists of 168 electronic text files comprising c. 1.5 million words of running texts in c. 120,000 sentence tokens. Every text file has been assigned a rough date of composition

based on arguments offered in the professional literature. Observations were made within single finite clauses. All examples will henceforth be cited by their respective corpus conventions.

The loss of *ne* in SN, (1), has been quantified several times before and hence scholars have established good measurement procedures that can be replicated here (Frisch 1997: 33, Wallage 2008: 645, Table 1, Newberry *et al.* 2017: 225, Truswell *et al.* 2019: 30). The present quantification groups together all *ne* and *ne... not* structures (Stage I, Stage II) and compares them to clauses with *not* on its own (Stage III). It excludes all sentences with additional negative items, such as negative objects, etc. The operationalization of the negative particle *ne* and the secondary negator *not* is carried out in the following way: Items are classified as *ne* if they are labelled as NEG and do not include the grapheme *t* (e.g., *ne, ni, no*). Conversely, items are categorised as *not* if they are labelled NEG and do include *t* (e.g., *nawhiht, noht, not*) or, rarely, co-occur with another NEG without *t* (e.g., *ne ... na*). Moreover, the *ne* counts include all instances of *ne* fused to a finite verb, such as *nis* ‘is not’ *nat* ‘does not know’ or *molde* ‘would not’ (contractions of this kind are excluded e.g., in Wallage 2008), (8).

- (8) Example of fused (contracted, clitic) *ne* – counted towards *ne*
alle ðe ðine Behode healden nelleð
 all that your Order hold not-want
 ‘all who do not want to obey your order’ (CMVICES1,19.224)

Likewise, instances of expletive *ne*, required in some embedded contexts but not actually interpreted as semantically negative, are indiscriminately added to the *ne* dataset (e.g. Jack 1977, Wallage 2017: chapter 3), (9).

- (9) Example of expletive (redundant, paratactic) *ne* – counted towards *ne*
Sche wold for noman wond [þat sche no wold to him fond]
 she would for no-man hesitate that she not would to him proceed
 ‘She would hesitate for nobody to proceed to him’
 rather than: # ‘She would hesitate for nobody *not* to proceed to him’
 (AmisAmiloun,28.[Stanza_46].552.223)

The secondary negator *not* is considered in its typical post-verbal position, (1c), as well as in other, rarer syntactic configurations (position as a diagnostic of

grammaticalization in Frisch 1997, analysis of syntactic positions of *not* e.g., in Haerberli – Ingham 2007, van Kemenade 2011), (10).

- (10) Example of atypical position of *not* – counted towards *not*
De oðer nazt him Ø awrecþ ðeruore
 the other not him avenges therefore
 ‘the other does not therefore avenge it’ (CMAYENBI,115.2210)

Some forms of negation are ambiguous. In particular, forms of *not* can often be interpreted as SN or as a quantifier ‘naught, nothing’ (11a). Another kind of ambiguity arises with initial *ne*, which could be parsed not only as SN but also as a negative conjunction ‘nor’ (11b). Cases such as these are not disambiguated manually but classified in accordance with the corpus annotation.

- (11) Ambiguous forms of SN – counted according to corpus annotation
- a. *Spare Ø wold he nouzht.*
 spare would he not/nothing
 i) He would not show mercy (spare). (= intransitive + negation)
 ii) He would forgive (spare) nothing. (=transitive + negative object)
 (SirCleges,46.210.115)
- b. *Ne sal þeih no man samie þiar. ne þarf he him adrade.*
 not shall though no man shame there not/nor need he himself fear
 i) No man shall be ashamed there though. He shall not be afraid (= negation)
 ii) No man shall be ashamed there though. Nor shall he be afraid (= conjunction)
 (PoemaMorale,143–144.225.165–167)

The searches returned 9,354 examples of SN (4,800 with *ne*, 4,554 without *ne*).

Next, the loss of *ne* is measured in NC structures with negative adverbs and adverbial phrases, (2). The most frequent lexical item in this group is the adverb *never*. However, several additional expressions are counted as well, including *nevermore*, *nowhere*, *no more*, *no longer*, *nevereft*, etc. An example is given in (12). As before, hits were only considered if they did not involve other negative elements, such as negative objects, negative subjects, etc.

- (12) Additional example of loss of *ne* in NC with negative adverbial
- a. *thei ne were neveremo withouten the tormentz of hir wikkidnesse*
they not were nevermore without the torments of their wickedness
'they were nevermore without the torments of their wickedness'
(CMBOETH,448.C1.398)
 - b. *The Jewes being in ther lyberte or captiuyte. Ø had neuer moo kynges*
the Jews being in their liberty or captivity had never more kings
'The Jews, whether in liberty or captivity, never had kings again'
(CMFITZJA,A5R.68)

The search queries retrieved 1,881 relevant hits (868 with *ne*, 1,013 without *ne*).

The next measurement concerns the loss of *ne* in NC with negative objects, (3), and negative subjects, (4). Elements are classified as negative when they are negatively quantified, (3), or negatively coordinated, (4). Negative quantification and coordination not infrequently co-occur, giving a distinctly emphatic character to the affected phrase, as in (13).

- (13) Co-occurrence of negative quantification and negative coordination
[*nan wihht, nan enngell, nan mann, Ne nanesse kinness shaffte,*]
no being no angel no man nor of-no kind creature
Ne mihhte þurh himm selfenn þa Seffne godnessess shæwenn
not might through him self the seven goodnesses show
'No being – no angel, no man, or creature of any kind – can by himself glimpse those seven virtues' (CMORM,DED.L257.54)

Negative quantifiers in object position can be stranded, as in the example with *ne* in (14).

- (14) Stranded negative quantifier as negative object
felawe, nauede he [non,]
fellows not-had he none
'He did not have any friends' (Maregrete,494.176.181)

Negative objects can also be fronted, as in the example without *ne* in (15).

- (15) Fronted negative object
 [*non oðer*] Ø *wile ge more*;
 none other wants she more
 ‘She does not desire anything else more’ (Bestiary,408.22.708.[Turtle-Dove_Nature])

The corpus annotation did not provide a practical way to extract all examples of negatively coordinated subjects with extraposition of the negative conjuncts. The reason is that these structures are parsed as gapping, i.e., as individual but incomplete clauses, not as subject coordination. An example of such a structure is shown in (16).

- (16) Subject gapping – not included in the dataset
sunne þar ne sineð [ne mone] [ne storre]
 sun there not shines nor moon nor stars
 ‘The sun does not shine there, nor (does) the moon, nor (do) the stars’
 (PoemaMorale, 232.228.279)

Negative objects include negative predicates of copula verbs because objects and predicates are annotated with the same function tag in the parsed corpora, (17).

- (17) Negative predicate – counted towards negative object
I Ø am no leche
 I am no leech
 ‘I am not a physician’ (CMSIEGE,74.121)

Negative associates in existential constructions are treated as subjects. This is true for structures with overt expletives, such as *there* or *it*, (18), as well as for structures without an overt expletive, for example in cases of locative inversion, (19).

- (18) Negative associate of existential construction – counted towards negative subject
- a. *ther_i nys [non hope to escape]_i*
 there not-is no hope to escape
 ‘there is no hope of escape’ (CMCTPARS,291.C1.119)
 - b. *þer_i Ø is [no wattur]_i ner þe cyty þen flem Jurdane.*
 there is no water nearer the city than river Jordan
 ‘There is no water nearer to the city than the river Jordan’ (CMSIEGE,82.342)

- (19) Negative associate in locative inversion – counted towards negative subject
- a. *In þisse worlde nas [na laze ne na larþeu]*
 in this world not-was no law nor no teacher
 ‘In this world was neither any law nor any teacher’ (CMLAMB1,81.144)
 - b. *In Perce Ø was no wyghter man].*
 in Persia was no braver man
 ‘In Persia was no braver man’ (Alisaunder,152.3647.[Part_1].[Chap_15].2149)

As before, examples are not counted in multiple NC structures. The search queries yielded 2,189 examples of negative objects (842 with *ne*, 1,347 without *ne*) and 2,006 examples of negative subjects (867 with *ne*, 1,139 without *ne*).

Multiple NC are structures that involve at least two negative elements (not counting *ne*), (5), i.e., the co-occurrence of at least two negative phrases from the list comprising the secondary negator *not*, negative adverbials, negative subjects, negative objects or negative PPs. The examples in (20) provide additional illustrations of multiple NC.

- (20) Additional examples of the loss of *ne* in multiple NC
- a. *Naueþ [no man] [none sikerhede]*
 not-has no man no security
 ‘Nobody has any security’ (OwlNight,106.1268.702)
 - b. *And [no man] Ø myght not cope whythe Hym⁴*
 and no man might not cope with him
 ‘And no man could cope with him’ (CMGREGOR,219.2123)
 - c. *þu nowest [none mon] [nowithþ]*
 you not-owe no man nothing
 ‘You do not owe anybody anything’ (LofsongLord,215.131.75)
 - d. *ze Ø holde [no parlyment] [Wiþ no christen mon]*
 you hold no parliament with no Christian man
 ‘you should not hold parliament (chatter) with a Christian man’
 (HowHearMass,136.286.96.[Stanza_25])

Other kinds of negative phrases are not taken into account (e.g., negative adjective phrases). While rare, such discarded negative elements may lead to

4 Negative subject + *not*. The existence of sentences like (20b), NC with a negative subject and the secondary negator *not*, probably challenges the syntactic model proposed by Ingham (2000: 33), which seeks to rule out such structures. For more discussion, see Wallage (2017: 174).

some recall errors and misattribution of multiple NC structures. In total, the searches found 890 hits of multiple NC (395 with *ne*, 495 without *ne*).

Finally, the corpora can be queried for the structure of the greatest interest in this paper, NC with negative PPs, (6), (7). The searches are straightforward. The only complication worth mentioning concerns PPs that are not placed on the clausal level, but are more deeply embedded within another constituent. Such cases are difficult to recover in a principled way, and they are therefore not included in the counts, (21). They also do not contribute to the multiple NC data, (22).

- (21) Deeply embedded negative PP – not included in the dataset
- a. *ber nis* [_{NP} *lac* [_{PP} *of met no clop*]]
 there not-is lack of meat nor cloth
 ‘There is no lack of food or clothing’ (CMROLLTR,9.252)
- b. *and Ø has* [_{NP} *thoghte* [_{PP} *of na lufe of þe worlde*]].
 and have thought of no love of the world
 ‘and [they] have thought about not loving the world’ (Cokaygne,145.29.19)
 or perhaps: ‘and [they] have no thought of love towards the world’
- (22) Deeply embedded negative PP – included in NC with negative object, not multiple NC
- Ne do* [*nan ifell dede*] [_{PP} *Forr* [_{NP} *lufe* [_{PP} *off nan lifisshe mann*]]]
 not do no evil deed for love of no living man
 ‘You should not do any evil deed for love of any living man’ (CMORM,I,177.1461)

The corpora contained 481 instances of NC with negative PPs (193 with *ne*, 288 without *ne*).

2.2. Results

I will now present the results of this investigation and demonstrate that, if the decline of the negator *ne* is measured as described above, NC with negative PPs behaves markedly differently from the other patterns. Table 1 gives an overview over the temporal distribution of the data. It presents the number of *ne* occurrences out of the total number of relevant examples for the categories SN, NC and NC with negative PPs in four conventional period bins established by the Helsinki corpus.

Table 1: Overview over the temporal distribution of the occurrence of *ne* in SN, NC and NC with negative PP structures

Period	<i>ne</i> in SN	<i>ne</i> in NC	<i>ne</i> in NC with neg. PPs
M1 (1100–1250)	94.8 % (2,029/2,141)	93.0 % (1,665/1,790)	69.2 % (90/130)
M2 (1250–1350)	73.4 % (2,174/2,963)	52.7 % (1,085/2,057)	46.8 % (88/188)
M3 (1350–1420)	17.3 % (511/2,949)	10.6 % (220/2,071)	11.0 % (13/118)
M4 (1420–1500)	1.8 % (23/1,301)	0.2 % (2/1,048)	4.4 % (2/45)

These figures serve only as a rough guide for expository purposes. The statistical analysis is conducted in the form of a mixed-effects logistic regression model on individual texts each with their own associated year estimate. Table 2 presents this model. It predicts the presence of *ne* from time, the construction types outlined in the previous section (with SN as the reference value) and their interaction. It also controls for correlated errors on the text level through the inclusion of random text intercepts.

Table 2: Mixed-effects logistic regression model for the loss of *ne* in SN and NC

Formula = $Ne \sim \text{Year} * \text{Context} + (1 \text{Text})$			
N=16,801			
Fixed effects			
	Estimate	Std. Error	p-value
(Intercept)	0.30411	0.16167	0.1318
Year (standardised)	-3.01751	0.17251	<0.001***
Context			
(SN → NC with negative adverbials)	-1.05396	0.10275	<0.001***
(SN → NC with negative objects)	-1.03037	0.09118	<0.001***
(SN → NC with negative subjects)	-1.12685	0.09041	<0.001***
(SN → multiple negative NC)	-0.92932	0.12543	<0.001***
(SN → NC with negative PPs)	-1.70593	0.16266	<0.001***
Year: Context interaction			
(SN → NC with negative adverbials)	0.24385	0.12715	0.05514.
(SN → NC with negative objects)	0.14977	0.12180	0.21884
(SN → NC with negative subjects)	0.17192	0.12399	0.16558
(SN → multiple negative NC)	0.34717	0.14301	0.0152*
(SN → NC with negative PPs)	1.10182	0.17433	<0.001***
<u>Random effect:</u>			
Texts: 159			
Variance of random intercepts: 2.477			

The year variable is a highly significant predictor in this model. It is reported in Table 1 as a standardised *z*-score for the SN reference category to avoid scaling issues. On the original scale, the rate of change for SN would be estimated at -0.0335 log-odds per year, a speed at which it would take 274 years for *ne* to decline from 99 % to 1 % of use.

The context values, too, are returned as significant. Specifically, the log-odds of finding *ne* are highly significantly lower in all NC contexts as compared to SN. That means that NC appears to be more innovative than SN overall.⁵

The most important measure for the present purpose concerns the interaction term between year and context. The divergences in the rate at which *ne* is lost between most NC contexts and SN are rather slight and either marginally significant at the 5 % level only (for multiple NC and barely for NC with negative adverbials) or fail to reach statistical significance altogether (for NC with negative subjects and objects). These differences must be regarded as inconclusive because the model does not control for other important variables, such as dialect, genre, position of the negative elements, mood, information structure, etc. It is not implausible, however, to assume that the loss of *ne* occurs at roughly the same rate of change, or at least does not fluctuate very much, in these contexts. In contrast, the rate of change appears to slow down dramatically for NC with negative PPs in comparison to SN, and this difference is highly statistically significant. On the original scale, the year parameter for NC with negative PPs is returned as $-0.0335 + 0.012 = -0.0213$, which would imply a longer time span of 431 years for *ne* to decline from 99 % to 1 % of use in that context. In short, while the model is too rudimentary to allow firm conclusions about differences in the rates of change between SN and NC in general, there can be little doubt that NC with negative PPs behaves very differently from the other contexts – it tends to show a higher proportion of clauses without *ne* given any particular time⁶ and it thus seems to lose *ne* at a flatter slope than the other constructions.

5 The model in Table 1 is among the first to compare the loss of *ne* in NC and SN explicitly, contributing to an open research question mentioned in Frisch (1997: 33), “*ne* is lost from negative concord constructions as it is from sentential negation constructions. I have not systematically examined the data [...]. [This is] an open problem for future research” Wallage (2017: chapter 9.3.) also provides a quantitative model of the “relationship between the Jespersen Cycle and Negative Concord”. Statistical modeling of the relationship between the two contexts still requires further attention.

6 I am grateful to a reviewer for insisting on a formulation of this finding that makes it clear that *ne* in NC with negative PPs seems to have occurred less frequently than in other contexts “from the beginning already” so that a “starting point [that] is lower” may lead to a “slope to the bottom [that is] obviously less steep” (anonymous, p.c.).

The data come from 159 different text files. Hence, 9 texts did not include any markers of negation at all. The variance parameter of 2.5 indicates large variability between texts.

The model performs in an acceptable way. It fits the data appropriately, especially considering the low data quality of texts from medieval manuscripts (Pseudo- $R^2_{\text{marginal}}=0.591$, Pseudo- $R^2_{\text{conditional}}=0.776$). It has high classificatory power (C-index= 0.962). Figure 1 visualises the loss of *ne* in Middle English.

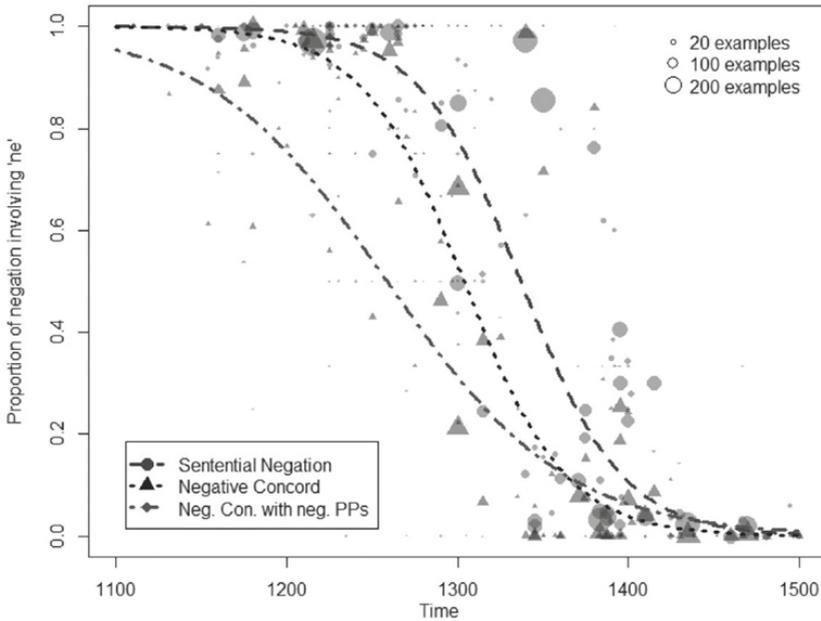


Figure 1: Graphical representation of the loss of *ne* in SN, NC and NC with negative PPs

I hope that the wording chosen here does justice to this recommendation. However, I would like to make two related remarks. First, it is not obvious from the data that the frequency of *ne*-absence *must* be lower in NC with negative PPs than elsewhere in early Middle English already on account of the small sample size (e.g., 4/4 or 100 % of all examples from texts dated before 1150 in my corpus material do in fact show *ne* with negative PPs). Second, I do not believe that an overall lower probability of *ne* with negative PPs than with other negative elements throughout the transitional period “implies” (anonymous, p.c.) a slower rate of change or vice versa. The two parameters are independent of each other. It is possible, and should perhaps even be expected *a priori*, that an overall lower proportion of *ne*-absence with negative PPs than with other patterns for all time points should *not* affect the rate of change at all, but that *ne* should simply die out sooner with negative PPs than elsewhere.

The graph plots the proportion of *ne* for every text against its rough date of composition. The size of each data point is proportional to the number of examples it contains. The graph also indicates the best estimates for the loss of *ne* for SN (dashed line), the combined NC data (dotted line) and NC with negative PPs (dotdash line). While the slope of the lines for SN and NC are relatively similar (Likelihood Ratio Test: Deviance Difference=3.72, $df=1$, $p=0.054$), the slope for NC with negative PPs is visibly flatter than the one for SN (Likelihood Ratio Test: Deviance Difference=32.83, $df=1$, $p<0.001^{***}$).

A few more tangential words on the results of this study are in order. First, the time course of the loss of *ne* found here concurs with previous accounts. The data suggest that the negative particle *ne* becomes largely defunct by the early to mid-fifteenth century, in accordance with previous observations, e.g. “*ne* was generally obsolete by the latter part of the 14th century” (Ingham 2006: 90), “the loss of *ne* around 1400” (Mizoguchi 2007: 65), “*ne* [is] lost in the fourteenth and fifteenth centuries” (Wallage 2017: 133), “*not* approach[es] 100 per cent usage by 1400” (Truswell et al. 2019: 30).⁷ Second, the regression analysis presented above is compatible with the interpretation that *ne* is lost somewhat earlier in NC contexts than in SN. Acceptance of the reality of the intercept difference, in turn, would have consequences for the analysis of the cause of the change. Specifically, the temporal difference would at least open up the possibility that negative elements in NC structures first acquire the ability to invert the polarity of a clause, hence making *ne* optional so that it can subsequently be dropped in SN too (*ne*-drop / rise of inherently negative elements in NC causally influences *ne*-drop in SN). This contrasts with the view that *not* first takes over the function of sentential negator from *ne*, so that *ne* can disappear in SN, and is subsequently lost in NC as

7 Nevalainen (2006: 260) finds that *ne* disappears in the *Corpus of Early English Concordances* only in the early sixteenth century, a good hundred years later than what other scholars have claimed. She cites one relevant example, reproduced in (ii).

(ii) *My lord, I hav nott ben vssed to thes ways, ne trust nott much to be.*
 my lord I have not been used to these ways nor trust not much to be
 ‘My lord, I have not become accustomed to these ways, nor do I think it likely that I will’ (CEEC, Thomas Darcy 1514, 77, Nevalainen 2006: 260, ex. 6)

It is possible that the discrepancy arises because exact cut-off points for the disappearance of a form are hard to define (perhaps the number of examples like (ii) is negligible) and because *ne* may see differential retention in its function as a negator ‘not’ and as a negative conjunction ‘nor’ (perhaps all examples are like (ii) in that they involve *ne* as a negative conjunction).

well with repercussions for the interpretation of *n*-words (*ne*-drop in SN causally influences *ne*-drop / rise of inherently negative elements in NC). Endorsements of this order of events are expressed in quotes such as, “*naugt* takes over the role as carrier of negation and becomes the main negative marker, resulting in the loss of *ne*” (Zeiljstra 2004: 54), “[t]he disappearance of *ne* precipitates the erosion of multiple negation” (Fischer et al. 2000: 87) or “from around 1400 onwards, as the proclitic negator *ne* was lost, *n*-items became intrinsically negative” (Ingham 2013: 147). The relative progressiveness of *ne*-loss in NC over SN also challenges the assumption that *ne* disappears in all contexts at the same time (*ne*-drop in SN and *ne*-drop / rise of inherently negative elements in NC do not causally influence each other). This view is expressed, for instance, in the following ways, “the decline in the use of *ne* is concurrent with a decline in the use of negative concord in general” (Frisch 1997: 33) or “the loss of *ne* follows the same course (both in terms of rate and intercept) whether it co-occurs with *not* or with a negative argument” (Wallage 2017: 186).

The discussion will now continue with the actual topic of interest, an exploration of possible reasons for the surprising divergence between the loss of *ne* in NC structures with negative PPs as compared to other negative structures.

3. Exploring the Differential Behaviour of Negative PPs

This section investigates three possible sources for the observed divergence in the rate of *ne*-drop in NC with negative PPs as compared to SN and other NC contexts. These are (a) measurement errors, (b), a distinction in grammatical function and (c) a semantic difference.

3.1. Measurement Errors

One should not rule out the possibility that the overall reduced proportion of *ne* and seemingly slow disappearance of *ne* with negative PPs as compared to other negative structures is simply an artefact resulting from measurement error. Closer inspection of the retrieved clauses did in fact reveal several questionable hits. I identified three types of negative PPs without *ne* that should plausibly not actually have been classified in this way.

The first type of problematic pattern, exemplified in (23), involves negative PPs annotated on the level of an embedded clause when there is a negator *ne* on the level of a higher clause. There are two reasons why such examples might have been incorrectly counted towards clauses without *ne* when they should actually be regarded as clauses with *ne*. First, the corpus annotation

may simply be incorrect in that the negative PP should be adjoined to the higher clause. A probable example is presented in (23a). Second, it may be possible that *ne* can sometimes license negative elements⁸ across finite clause boundaries.⁹ A possible instance of such a case is shown in (23b). (The bracketing in (23) represents the corpus annotation.)

- (23) Possible measurement error – *ne* in higher clause
- a. *Ne ðole ðu naure ðat [dieuel Ø rixi on ðe [pp,for none senne]]*
 not suffer you never that devil rule on you for no sin
 ‘Do not allow the devil to rule inside of you for [=despite the fact that you have] no sin’¹⁰
 ‘Do not allow the devil to rule inside of you for any sin [=seek penance for your sins]’¹¹ (CMVICES1,39.454)
- b. *I nolde [that thou Ø were a mony-maker [pp,for noo suche causes]]*
 I not-wanted that you were a money-maker for no such causes
 ‘I do not want you to be a money-maker for any such reasons’ (CMAELR4,3.70)

8 The assumption that *ne* in a matrix clause may license negative elements in an embedded finite clause is supported by relevant clauses with negative elements other than negative PPs, such as negative objects.

- (iii) *ne woldi [þat þou Ø heuedest [uilani || Ne shame]] ...*
 not would-I that you had villainy nor shame
 ‘I do not want you to have villainy or shame’ (DameSirith,12.251.128.[Wilekin])

It is noteworthy that such sentences often seem to occur with a form of *would*. The line break before *Ne* in (iii) may also be relevant as it could facilitate a gapping interpretation, ‘nor [would I that you have] shame’.

9 A related source of error comes from instances of matrix *ne* licensing a negative element within a non-finite clause. For example, sentence (iv) is counted towards SN with *ne*, but should perhaps rather be included in the counts for NC with a negative adverb.

- (iv) *Ne let [hit neure fram þe be]*
 not let it never from you be
 ‘Do not ever let it go from you’ (AssumpVirg,115.136.86)

Similarly, there are cases of *ne*-free matrix clauses followed by a negative element in a non-finite clause. Such examples are not collected at all. For example, sentence (v) is not included in the dataset, but it should perhaps be counted towards SN without *ne*.

- (v) *þey Ø bad [Jamys not teyche þe doctryne of Cryst]*
 they bade James not teach the doctrine of Christ
 ‘They asked James not to teach the doctrine of Christ’ (CMSIEGE,71.39)

10 Reading according to corpus annotation, probably wrong.

11 Reading with negative PP placed in the higher close, probably correct.

The second type of problematic structure, illustrated in (24), involves issues of constituent negation.

- (24) Possible measurement error – constituent negation of negative PP
ðe sune þe Ø drat his fader, [pp naht for none pine], ac drat
 the son who feared his father not for no pain but feared
him ðat he forliese his swete luue
 him that he lose his sweet love
 ‘the son who dreaded his father, not for fear of pain, but because he might lose his love’ (CMVICES1,63.690)

It is debatable whether this hit should be counted as a negative PP without *ne* because the negative PP is in fact within the scope of negation, *naht*. The constituent negation very likely bestows on the relevant phrase a contrastive reading (not A, but B). It is therefore a rather special case of a negative PP and had perhaps better be ignored.

The last kind of problematic hit, given in (25), raises the possibility of faulty or ambiguous PP attachments with respect to noun phrases. (The bracketing in (25) represents the corpus annotation.)

- (25) Possible measurement error – PP attachment
þo / [þet Ø habbeþ [NP drede] [pp of naht]
 those that have dread of naught
 ‘those that have dread of nothing’ (CMAYENBI,32.519)

The negative PP in this example is parsed on the clause level. Yet, a more plausible structure would embed the negative PP within the preceding NP, ‘dread of nothing’. Had the sentence been annotated thusly, the example would not have been retrieved (cf. example (21) above).

All of the above problems lead to a slight inflation of the dataset of negative PPs without *ne*. If such misattributions happen predominantly during the early parts of the change, they could cause an apparent slow-down in the rate of *ne*-loss.

There are 30 errors of the above types in the negative PP dataset. Removing these instances does lead to some convergence in the rates of the loss of *ne* between SN and NC with negative PPs, but the difference remains highly significant (Likelihood Ratio Test: Deviance Difference=25.4, df=1, $p < 0.001^{***}$). Therefore, measurement errors alone are unlikely to be the cause of the slow-down. Alternative explanations should be sought.

3.2. Distinction in Grammatical Function

Another hypothesis that merits investigation is that the grammatical function of the negative PP – whether it functions as adjunct or complement – may play a role (see examples (6), (7)). In particular, negative adjunct PPs expressing emphatic refusal, ‘definitely not, absolutely not, not at all, no matter what,’ saliently take clausal scope in a way similar to the secondary negator *not*. Therefore, both forms easily express a negated proposition even when *ne* is absent. This is exemplified in (26).

- (26) Emphatic negative adjunct PPs without *ne*
- a. *Hwan ubbe hauede þe gold ring, Ø Hauede he youen-et*_[pp, for no þing],
when Ubbe had the gold ring had he give it for no thing
‘When Ubbe had the golden ring, he would (definitely) not have given it [up] for anything’ (Havelok,45.1644.774)
 - b. *tai Ø Mai seved be* _[pp on naNkin wai]
they may seved be in no-kind way
‘they can (absolutely) not be saved in any kind of way’ (EDINCMAT.212)
 - c. *Scho Ø wil do wrang* _[pp on nan wyse]
she will do wrong in no wise
‘She will not do wrong in any way (at all)’ (EDINCMBT.657)
 - d. *þe Kyng Ø myght* _[pp, for no maner þing] *ham fynde in*
the king might for no manner thing them find in
pleyn felde;
plain field
‘the king could not meet them in an open field [for battle] for anything (no matter what)’ (CMBRUT3,225.4072)

It is possible that emphatic negative adjunct PPs, like the secondary negator *not*, take on the function of SN making *ne* superfluous, and hence the former, just as has been argued for the latter, may exert a causal influence on the loss of *ne*. If the facilitation of *ne*-drop by emphatic negative PPs occurs even in early texts, then this could result in the observed divergence in the rate of change in this context.

Manual coding yields 78 clear instances of emphatic negative adjunct PPs (38 with *ne*, 40 without *ne*). However, exclusion of these hits from the corrected dataset does not lead to any meaningful harmonization in the rates of change between SN and NC with negative PPs (Likelihood Ratio Test: Deviance Difference=19.0, df=1, $p < 0.001^{***}$). It follows that the adjunct – complement distinction probably cannot explain the smaller than expected time effect on the loss of *ne* in NC with negative PPs.

3.3. Semantic Differences

Finally, one might reason that negative PPs without *ne* convey a meaning different from those with *ne*. If so, instances of negative PPs without *ne* should already exist in very early documents and those examples might illuminate the semantic distinction.

To this end, a number of negative PPs without *ne* were investigated cursorily in Old English texts (Taylor et al. 2003). Relevant examples are rare. However, it is possible that examples such as (27) point towards an interpretative difference.

- (27) Negative PP without *ne* in Old English
Crist, þe heofon and eorðan [_{pp} of *nanan þingan*] \emptyset *geworhte*
 Christ who heaven and earth of no thing worked
 ‘Christ who created heaven and earth out of nothing’ (coeust,LS_8_[Eust]:60.59)

The reason why (27) does not occur with *ne* might be that the sentence is not actually negated – the negation conveyed by the negative PP does not scope over the clause; the negative PP does not actually mean ‘nothing’, but rather ‘something that is conceptualised as nothingness, emptiness.’ It is also noteworthy that the nominal complement of the negative PP is bare or bleached, i.e., ‘nothing’, rather than ‘no’ + full noun, which may be a favouring determinant for the specific interpretation.

It is not too difficult to formalise this intuition in first-order logic. The ordinary denotation of *no* is a negative existential quantifier, (28a) (e.g., Barwise – Cooper 1981, among many others). The wide scope of negation over the existential quantifier can easily map on sentential negation in natural language. The proposed special denotation of *no*, call it *no*_{substance}, can be regarded as an existential quantifier whose restrictor is negated, (28b) (related remarks e.g., in Penka (2001: 44, 46), Seuren (2010: 56), but the phenomenon is hardly ever discussed in these terms). Since negation does not scope over the whole proposition, it cannot surface as sentential negation in natural language.

- (28) Proposed semantic ambiguity of *nothing*
- [[no]] = $\neg \exists x (P_{(x)} \ \& \ Q_{(x)})$ ‘there is no P that is Q’
 - [[no_{substance}]] = $\exists x (\neg P_{(x)} \ \& \ Q_{(x)})$ ‘there is a non-P that is Q’

For example, the proposed semantics of *nothing* would suggest a truth-conditionally relevant difference for sentences such as *Mary saw nothing*, as sketched in (29).

- (29) Illustration of proposed semantic ambiguity of *nothing*
- a. A robbery happened right in front of Mary's house. The police asked her, but ... Mary saw nothing.
 $\neg \exists x$ (THING_(x) & SEE_(mary, x)) 'the set of things that Mary saw is empty'
 - b. Mary was sick. Nausea overcame her. Her vision became blurry. She fainted and ... Mary saw nothing.
 $\exists x$ (\neg THING_(x) & SEE_(mary, x)) 'Mary saw something that is not a thing, blackness'

While one can formally pinpoint the truth-conditional difference between *nothing* as 'not anything' and as 'nothingness' as in (28) above, it is much harder to predict *a priori* based on linguistic features which reading will be understood. It may be important to note that the difference seems to become more salient in PPs than in other types of phrases. I will tentatively assume that the 'no substance' reading cannot easily be predicted but is heavily context dependent.¹²

The relevance of the hypothesised semantic distinction of negative existential quantifiers for the presence or absence of *ne* is supported by several related facts. First, Middle English continuations of the "(create) out of nothing" type are likewise attested without *ne*, as illustrated in (30).

- (30) Middle English negative PP without *ne*, "(create) out of nothing"
- | | | | | | | | | |
|-----------|------------|------------|-------------------|-------------|---------------|-----------------------|-------------|----------------|
| <i>he</i> | <i>all</i> | <i>þis</i> | <i>middelerd.</i> | \emptyset | <i>makede</i> | [<i>pp</i> <i>of</i> | <i>rett</i> | <i>nouþt</i>] |
| he | all | this | middle-earth | made | of | right | naught | |
- $\exists x$ (\neg THING_(x) & CREATE-MIDDLEEARTH-OUT-OF_(God, x))
 'he [God] made all this middle-earth of right nothing' (Maregrete, 492.112.113)

Second, the analysis can successfully be employed to account for modern language analogues of such constructions. For example, the Italian translation of 'God created the world out of nothing' likewise does not occur with sentential negation despite the fact that this language otherwise obeys negative concord rules.

12 One reviewer proposed that it might be possible to "check the factors [determining the scope of negation in negative existential quantifiers] operating in Modern English and see if they work in earlier stages of English" and illustrated by writing, "while 'nothing' normally marks SN ('she is interested in nothing'), it does not have to ('she works for nothing')" (anonymous, p.c.). I agree that an attempt to identify Modern English factors regulating the scope of negation in negative PPs could be fruitful. Unfortunately, however, I found it exceedingly difficult to identify such factors for Modern English and to approach intuitions for Middle English.

- (31) Approaching medieval English intuitions with modern languages: *Italian*
 Dio \emptyset ha creato la terra dal **nulla**
 God has created the earth from-the nothing
 $\exists x (\neg \text{THING}_{(x)} \ \& \ \text{CREATE-THE-WORLD-OUT-OF}_{(\text{God}, x)})$
 ‘God created the world out of nothing’¹³

Third, the semantic distinction can be extended to other kinds of Middle English negative PPs that occur without *ne*. This includes (a) the ‘to naught’ construction, which conventionally, or at least highly frequently, expresses violent damage or reduction as the goal argument of verbs such as *do*, *bring*, *come*, etc. hence metaphorical ‘nothingness’, (32), (b) the ‘for naught’ pattern,¹⁴ which can be paraphrased as ‘for no good reason, to no avail, in vain,’ (33), or structures in which the negative PP functions as the predicate of a copula verb, (34).¹⁵

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- 13 If a sentential negator were added to this sentence, it would not simply come to mean ‘God did not create the world out of anything’ (i.e., a description of a state of affairs that is true if there is no substance that God created the world out of), contrary to what one might expect for a negative concord language. Rather, the sentence would mean ‘God did not create the world out of nothing’ (i.e. a description of a state of affairs that is true if it is not the case that there is nothingness that God created the world out of), as shown in (vi).

(vi) Dio **non** ha creato la terra dal **nulla**.
 God not has created the earth from-the nothing
 $\neg \exists x (\neg \text{THING}_{(x)} \ \& \ \text{CREATE-THE-WORLD-OUT-OF}_{(\text{God}, x)})$
 ‘God did not create the world out of nothing’

I would like to thank Margerita Pallottino for providing the Italian sentences and the semantic judgments. All errors are my own.

- 14 The expression *for naught* is an example of an expression that appears both as an emphatic negative adjunct PP ‘in absolutely no way’ and as a negative PP that does not take clausal scope ‘for no good reason, in vain.’ Hence, hits with such a phrase become ambiguous, (vii).

(vii) *for nozt ze habbeþ fere*
 For naught you have fear

- a) ‘you do not have fear in any way whatsoever’ (=emphatic negative adjunct PP)
 b) ‘you have fear for no good reason’ (=negative PP without clausal scope)
 (CORP145SELT.501)

Context is needed to decide which meaning is intended. For example, sentence (vii) very likely conveys the second reading shown because contexts make it clear that the addressees are in fact afraid.

- 15 The list of negative PPs that can be analysed with restrictor negation may not be exhaustive. In particular, there are other types of negative PPs not taking clausal scope that

- (32) Middle English negative PP without *ne*, “to naught”
and \emptyset *brouȝt* *Israel* *greteliche* [_{pp} *to* ***nouȝt***].
 And brought Israel greatly to naught
 ‘and [36God] harshly reduced Israel to nothing’ (CMEARLPS,97.4237)
- (33) Middle English negative PP without *ne*, “for naught”
Wendest þou *I* \emptyset *were* *ded* [_{pp} *for* ***nowȝt***?]
 weened you I were dead for naught
 ‘Did you think I was dead for nothing / for no good reason?’ (*Harrow Hell*,16.169.102)
- (34) Middle English negative PP without *ne*, predicate
but *al* *it* \emptyset *was* [_{pp} *for* *nouȝt*]
 but all it was for naught
 ‘It was all for nothing / in vain’ (CMBRUT3,2.26)

While potent, the semantic explanation is not without problems. Most importantly, there are, already in Old English, instances of negative PPs whose negation does take clausal scope but which nevertheless do not co-occur with *ne*. Two illustrative cases are given in (35).

- (35) Old English negative PPs whose negation takes clausal scope without *ne*
- a. *ond he* [_{pp} *mid nængum ðingum*] \emptyset *mihte hire geþoht oncerran*
 and he with no things might her thought change
 ‘And he could not make her change her mind by any means.’ (comart3,Mart_5_
 [Kotzor]: Ju23,A.8.1039)
- b. *þa wrygedan gastas hine* [_{pp} *mid nænige ege* *ne* *mid geswencnisse*]
 The evil ghosts him with no awe nor with torment
gretan \emptyset *dorston*.
 greet dared
 ‘The evil spirits did not dare visit him with any fear or torment’ (cobede,Bede_
 3:9.186.18.1877)

occur with complements other than bare quantifiers. The analysis as “nothingness” may be less plausible for these cases, but their semantic form may still be related to this proposal. It is in fact difficult to see which factors exactly prevent or allow clausal scope of negative PPs. One can perhaps say that negative PPs can take clausal scope by default and those that cannot do so function as special conventionalised idioms. Modern English examples include *for no reason* (*he came for no reason* ≠ *he didn’t come for any reason*) or *in no time* (*he solved the problem in no time* ≠ *he didn’t solve the problem in any time*). One relatively common Middle English candidate of this type might be the phrase *for no good*. At any rate, expressions of this kind would require greatly subjective interpretations and they have therefore not been systematically examined here.

This shows that the semantic generalization may be incomplete. The negator *ne* with negative PPs may not only be absent when the sentence is not actually negated but also for other (unexplained) reasons. Perhaps negative PPs are particularly susceptible to defy negative concord requirements and may be at the forefront of the loss of negative concord in the history of English. On the other hand, the examples may also be explainable by confounding factors, such as faulty manuscript copying, editorial practices or Latin interference effects.

The dataset includes 101 examples of negative PPs that can be paraphrased as ‘nothingness.’ They fall into one of the categories outlined above, “(create) out of nothing” (30), “(bring) to naught” (32), “(do) for naught”, (33), or predicate (34). They all unfailingly occur without *ne*, which is itself a strong indication that the semantic explanation points in the right direction. In addition, removal of these observations from the corrected dataset aligns the rate of *ne*-loss in the negative PP context substantially more closely with the SN context. The time predicted for the reduction of *ne* from 99 % to 1 % of use is now 317 years, still slower than the 274 years estimated for SN, but far more realistic than the 431 years returned earlier. The inclusion of the interaction term remains significant, but only at the 5 % level (Likelihood Ratio Test: Deviance Difference=6.9, $df=1$, $p<0.05^*$). Either the semantic explanation offers a partial solution to the puzzle or it might be able to resolve the divergent rates of change entirely in a more sophisticated statistical model with additional intra- and extra-linguistic variables. In either case, there is good evidence to suggest that the high prevalence of negative PPs with restrictor negation is in large part responsible for the differential behaviour of the loss of *ne* with negative PPs.

4. Conclusions

This paper presented a quantitative measurement of the loss of the Middle English negative particle *ne* in its function as SN and in various NC contexts. It demonstrated that *ne* tends to be overall less frequent in structures with negative PPs and seems to be lost more slowly in that context than in other environments. An investigation of possible reasons for this divergence suggested that one should make a distinction between ordinary negative PPs that can invert the polarity of their clause, which thus likely occur with *ne* as frequently as other *n*-items, and negative PPs that negate only their restrictor, yielding a “nothingness” interpretation, which therefore does not occur with *ne* to form a negative concord structure. Since the latter type is quite frequent in the surviving Middle English text data, it is probably responsible for the apparent slow-down in *ne*-drop with negative PPs. Future investigations of the loss of NC in the history of

English should distinguish between these two types of negative PPs in order to reduce noise.

Three extensions of this research are worth considering. Firstly, one should substantially enhance the statistical model of the loss of *ne*. Some additional variables to add are dialect, (Southern texts preserve *ne* somewhat more robustly than Northern texts, Ingham 2006), and a large number of linguistic variables, such as verb type (functional verbs have a lower probability to occur with *ne*, Iyeiri 2001: chapter 4) or priming (e.g., *ne* is more likely if it is preceded by another *ne*, Ecay – Taminga 2017), etc. Secondly, the quality of the dataset used in this study can be improved. It is possible to code for additional, albeit rarer, negative phrases (e.g. negative adjective phrases). Long-distance licensing of NC across clause-boundaries is not currently captured well in the data (see examples (21), (22), (ii), (23), (iii), (iv)). Finally, negative coordination causes some problems that should be resolved (see examples (11b), (16)). Thirdly, a detailed investigation of the occurrence of *ne* with negative PPs in Old English may be able to strengthen the semantic differentiation proposed here.¹⁶

Overall, this study adds to a body of work that suggests that *ne* declines at the same rate in SN and in NC structures. If so – once the divergent rate of change with negative PPs is resolved – it should be possible to measure the loss of *ne* in all negative clauses jointly (rather than in SN and NC separately). This would greatly increase the sample size to more than 15,000 examples (cf., $N=1,929$ in Frisch 1997: 33, $N=5,556$ in Wallage 2008: 645, Table 1). The resulting models could perhaps help to resolve theoretical questions about causal associations between the Jespersen Cycle and NC. They could also be useful in the classification of texts of uncertain date or dialect. For those reasons, one should regard the loss of *ne* as the most important English morpho-syntactic change of the fourteenth century.

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16 One reviewer offered another avenue for extending this research, writing “Could it be, that the end of negative concord had its roots in such phrases [negative PPs with a nothingness reading], and that analogical extension obviously affected other *ne* + neg PP constructions first?” (anonymous, p.c.). It is difficult, however, to turn this interesting idea into a solid, testable prediction.

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