

## Persistence as a diagnostic of grammatical status: the case of Middle English negation

(For consideration as a talk or poster)

**Introduction** Quantitative studies of language variation and change typically treat each observation of a variable linguistic phenomenon as independent. It is well known, however, that this useful abstraction does not always hold in reality. A variety of syntactic variables have been shown to be subject to **persistence**: the tendency to repeat recently-used constructions. Originally demonstrated experimentally (Bock 1986), this phenomenon has been identified in both written and spoken corpora (Gries 2005, Szmrecsanyi 2006, inter alia). According to Branigan et al., “if the processing of a stimulus affects the processing of another stimulus, then the two stimuli must be related [...] if the relationship between the two stimuli is syntactic, then we can use this relationship as a way of understanding what syntactic information is represented” (1995:490; see also Pickering & Branigan 1999, Ferreira 2003, Pickering & Ferreira 2008).

We propose using persistence effects to diagnose the grammatical relationship between surface forms in cases of variation or change, in a similar manner to the Constant Rate Effect (CRE, Kroch 1989), and illustrate our proposal with the change from *ne* to *not* as the sentence negator of English.

**Background** In Old and early Middle English, the exponent of sentence negation in English was *ne*. During the Middle English period (ca. 1100-1500), *ne* was replaced by *not*, with an intermediate period of variation where either or both could appear. Frisch (1997) argues that sentences with *ne* and *not* are derived by choosing independently to insert both *ne* and *not* as exponents of sentence negation. This hypothesis is supported by a CRE argument: the rate of the loss of *ne* and the rise of *not* are different, indicating that they are not subsumed by a single grammatical parameter. The hypothesis also makes a prediction about persistence: uses of *ne* should facilitate further uses of *ne*, but have no effect on uses of *not*. *Not* should behave conversely.<sup>1</sup> Wallage (2008) challenges Frisch’s conclusions, using an expanded dataset and new analytical methods; he concludes that *ne+not* coexists in the grammar with *ne* and *not*.

**Data** The data for this paper come from the Penn-Helsinki Parsed Corpus of Middle English, version 2 (Kroch and Taylor 2000). 4574 negative sentences were extracted; each was coded for the presence of *ne* and *not* in the token itself and in the preceding negative sentence. We restricted the analysis to the time period between 1250 and 1350 (1144 tokens); this is when the change is approximately halfway complete and thus robust amounts of data are available for every condition.

**Results** The counts of sentences are shown in Table 1. Figure 1 shows the persistence relationships among surface forms. The horizontal lines are averages across the different preceding conditions. (For instance, the red line is an average of the red bars, weighted by the number of data points that contributes to each bar.) Each surface context facilitates itself only. This fact receives a natural interpretation in a model where each surface form is a grammatical object: a previous occurrence of an object makes it more likely to be immediately reused. It does not rule out an analysis where the independent objects are *ne* and *not*, however. In such a case, the high frequency of *ne+not* sentences following other *ne+not* sentences is attributable to the fact that *ne* facilitates itself, and *not* does so as well.

However, the independence hypothesis cannot explain Figure 2, which shows the frequency of sentences containing *ne* and those containing *not* following each of the three surface sentence types (sentences with *ne+not* are counted in both categories). As expected, *ne* is very common following

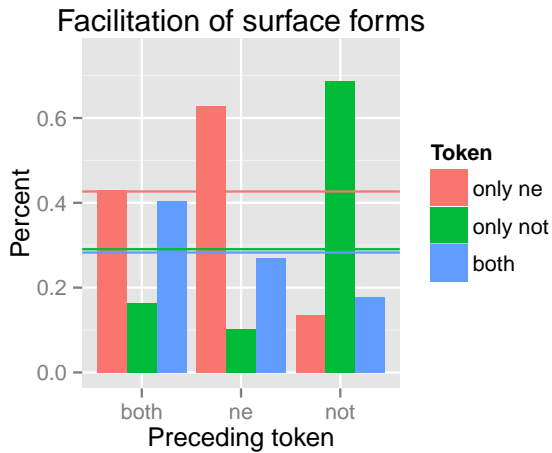
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<sup>1</sup>The uses of the two negators are not strictly independent in the statistical sense, as the necessity to express the meaning of negation will force one or the other variant to be inserted. However, our analysis accounts for this.

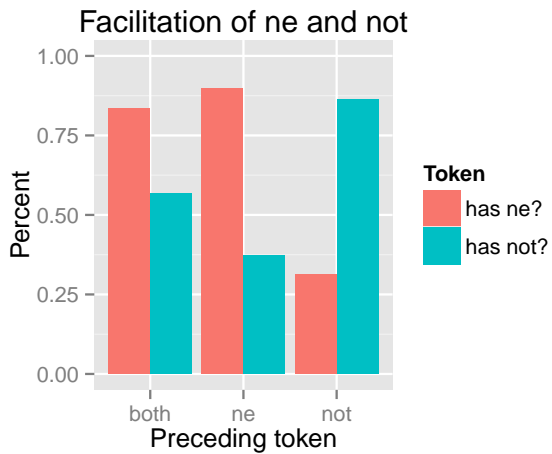
*ne* (the second red bar from the left is high) and *not* is common after *not* (the third blue bar is high). An account where *ne* and *not* are grammatically independent predicts that *ne+not* sentences should have the same effect as *ne* alone on the use of *ne* in a following environment, and the same effect as *not* alone on the following use of *not*. Since (under the independence hypothesis) *ne* and *not* are structurally unrelated, neither should suppress (or promote) the other. The leftmost red bar shows that the *ne* half of this prediction is borne out – it is not meaningfully different from the second red bar. However, the difference between the first and third blue bars indicates that the *not* half of the prediction isn't borne out: *ne+not* sentences do not facilitate the appearance of *not* to the same degree as sentences with *not* alone.

**Conclusion** In the case of Middle English negation, the persistence data supports Wallage (2008)'s contention that *ne* and *not* are not grammatically independent. More broadly, persistence effects relate patterns of language use to grammar, just as the CRE does. Since these two modes of analysis are logically independent, it is possible to compare the information they give us. When they match, the conclusions about the structure of grammar drawn from either are strengthened.

**Figure 1**



**Figure 2**



		Previous negation		
Negation		<i>ne</i>	<i>not</i>	<i>ne+not</i>
<b>Table 1</b>	<i>ne</i>	198	33	114
	<i>not</i>	38	207	76
	<i>ne+not</i>	98	80	300

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