

## Priming effects in language change as diagnostics of grammatical structure

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**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 hold in reality. A variety of syntactic variables have been shown to be subject to **structural priming**: 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 Estival 1985, Pickering & Branigan 1999, Ferreira 2003, Pickering & Ferreira 2008).

We propose using priming effects to diagnose the grammatical relationship between surface forms in cases of diachronic change. We motivate our proposal with two case studies from the history of English, using data drawn from the Penn Parsed Corpora of Middle and Early Modern English, and the Penn-Helsinki Parsed Corpus of Early English Correspondence.

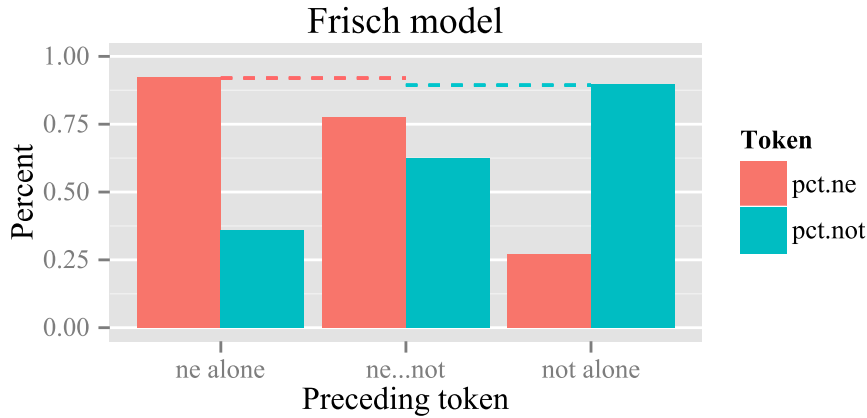
**Case 1** In Old and early Middle English, the exponent of sentence negation in English was *ne*. During the Middle English period (ca. 1100–1500), *ne* was replaced by *not*, with an intermediate period of variation where either or both could appear. Frisch (1997) argues that there are two exponents of sentence negation, *ne* and *not*; sentences with both are derived by choosing independently to insert each. Wallage (2008) challenges Frisch’s conclusions, arguing that *ne+not* exists as an atom in the grammar along with *ne* and *not*. These hypotheses make different predictions about priming. Under Frisch’s account, *ne* should facilitate any surface observation of *ne*, regardless of whether it co-occurs with *not*, and vice versa. Under Wallage’s account, each surface string should prime itself, but *ne+not* should not prime its component parts. The persistence evidence favors Wallage’s account, as seen in Figures 1a and 1b.

**Case 2** In Early Modern English (ca. 1500–1700), the language lost verb raising and gained do-support. In the period of the change, a minority of affirmative declarative sentences were produced with do-support; the affirmative declarative context does not license do-support in modern English. Recent work (Ecay 2012) has argued that these tokens of affirmative-declarative do-support are attributable to an intermediate grammar; this grammar also underlies many of the early tokens of what appears to be modern-type do-support (in e.g. negatives). This analysis predicts that there should be priming between affirmative declarative *do* and other types in the early stages of the change, as *do* in both cases is generated by the intermediate grammar. As the modern grammar becomes more widespread in negatives and questions in the later stages of the change, leaving behind affirmative declaratives, this priming relationship is predicted to attenuate; Figure 2 shows that this in fact happens.

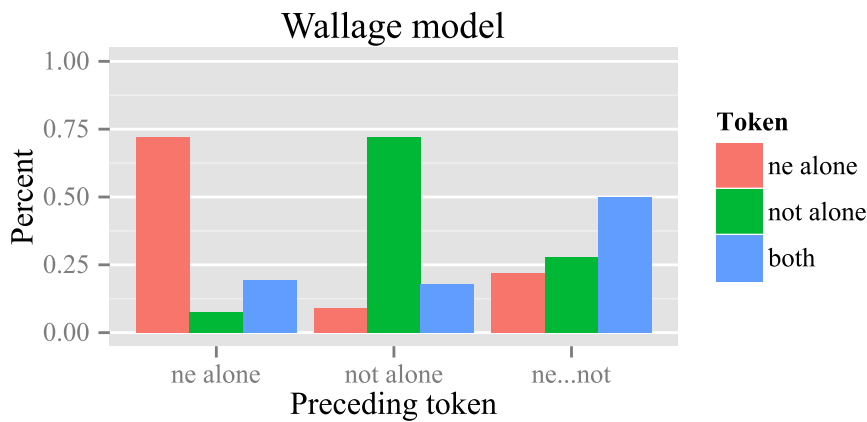
**Conclusion** In both the proffered case studies, priming data informs the analysis of historical changes. Since analysis of priming data is logically independent from grammatical theory-based inquiry, the convergence of these two types of result strengthens our conclusions from either. Priming can thus provide further evidence in favor of complex structural analyses and allow linguists to relate patterns of language use to speakers’ mental grammars.

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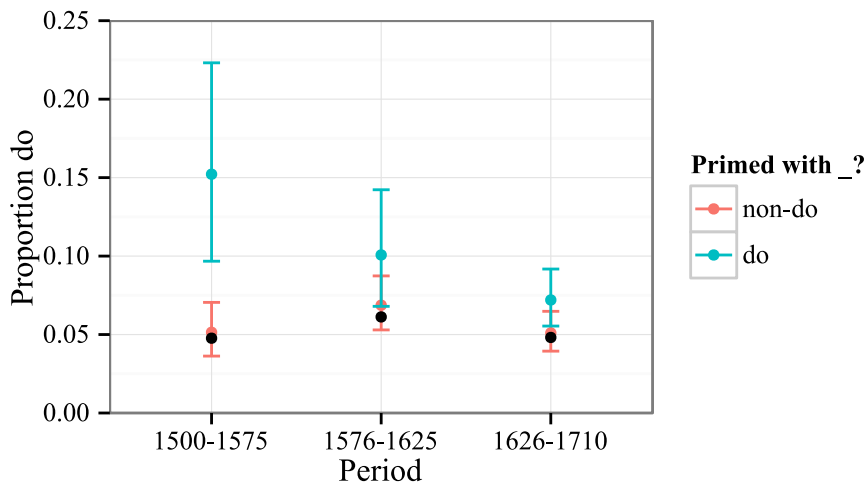
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**Figure 1a** Frisch (1997)’s model as applied to negator variation from 1250–1350. Contrary to fact, the middle set of bars are predicted to be equal in height to the horizontal lines (traced from the higher bars in the two flanking groups).



**Figure 1b** Wallage (2008)’s model as applied to negator variation from 1250–1350 (with correction for adverbial *not*). The prediction that one bar in each group should be meaningfully taller than the others is borne out.



**Figure 2** Priming of affirmative declarative *do* by modern-type *do*. Black points represent the baseline rate of *do*. Error bars report 95% confidence intervals (by the Clopper-Pearson exact method). The strength of the priming effect (= distance between blue and black dots) drops steadily over time.