A CONSTANT RATE EFFECT WITHOUT STABLE FUNCTIONS

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Many grammatical changes progress uniformly across linguistic contexts, but with different temporal offsets in different contexts. This is the **Constant Rate Effect**, or CRE (Kroch, 1989). For Kroch, the CRE reflects competition between functionally equivalent forms: within the terms of the standard equation (1) describing S-shaped change, (Bailey, 1973; Blythe & Croft, 2012), a CRE arises when s is constant across contexts, but k varies. This implies a direct link from CREs to **grammar competition**, in which competing forms realize the same function. It situates competition most naturally in adult communicative strategies, and construes such instances of language change as evolution of a population of forms which realize certain communicative functions.

$$\frac{p}{1-p} = e^{k+st} \leftrightarrow p = \frac{e^{k+st}}{1+e^{k+st}}, p \text{ being the probability of a given form} \quad (1)$$

We present a CRE that is better analysed in terms of acquisition rather than use. It concerns **headed *wh*-relatives** in English like *the person [[to whom]$_i$ I spoke __$_i$]*, with a clause containing a *wh*-phrase modifying a noun phrase.

Headed *wh*-relatives emerged slowly in Middle and Early Modern English, (c. 1100–1700). The first examples had oblique and adverbial *wh*-phrases; argumental relatives with *which* followed by c.1350, with *whom*- and then *who*-relatives emerging in the 15th century. Nevertheless, the rate of change across these linguistic contexts is near-identical. Fig. 1 demonstrates this for relatives with *wh*-PPs and with NP *which*, using data from the Penn Parsed Corpora of Historical English (Kroch & Taylor, 2000; Kroch, Santorini, & Delfs, 2004).[a]

Relativizer *which* has been in competition with *that* and $\emptyset$ as strategies for relativizing on argument positions over the last c.650 years. However, there was no competing strategy for relativizing PPs when *wh*-PPs emerged (earlier relatives

[a]Regression parameters are as follows: for PPs, $p = e^{0.0052t-11.8}$; for *which*, $p = e^{0.0058t-12.77}$. We omit PP data after 1550 from the regression analysis, because relatives with PP gaps after c.1550 are complicated by the emergence of preposition-stranding in English *wh*-phrases.

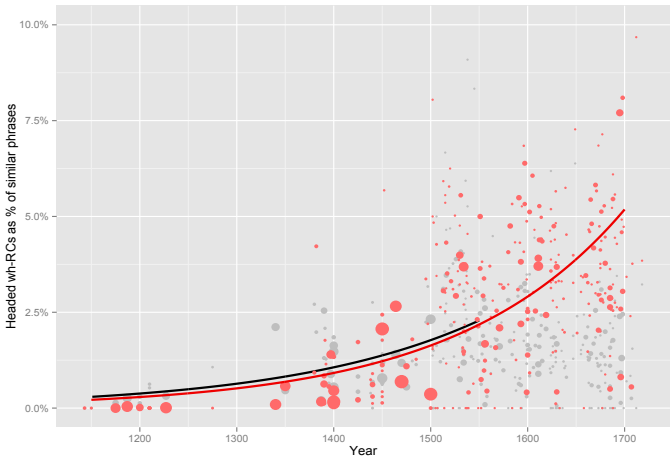

Figure 1. PPs functioning as *wh*-relativizers as a proportion of all PPs (black); subjects and object *which* functioning as *wh*-relativizer as a proportion of all subjects and objects (red). Each circle represents a single text; circle size is proportional to text size.

with demonstrative PP relativizers disappeared in Old English). Accordingly, the constant rate of change across *wh*-PP and *which*-relatives cannot reflect a similar competition process across the two construction types.

Instead, this change reflects competing functional specifications of *wh*-forms. Such competition, unlike Kroch's, is naturally located in acquisition, because a learner identifies a form before inducing a feature specification for it (Shipley, Smith, & Gleitman, 1969). This differs from competition among communicative strategies, but still maintains Kroch's logic of competition and selection.

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