ing a given fixation, the point of maximum salience dynamically changes to be highest at the saccade word target before the saccade execution. In interactive activation models (McClelland & Rumelhart 1981), the processing systems (as lexical access) are controlled by the connections among different interconnected units (features, letters, and words) and are not capacity limited.

Please stop using word frequency data that are likely to be word length effects in disguise

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Abstract: Reichle et al. claim to successfully simulate a frequency effect of 60% on skipping rate in human data, whereas the original article reports an effect of only 4%. We suspect that the deviation is attributable to the length of the words in the different conditions, which implies that E-Z Reader is wrong in its conception of eye guidance between words.

A computational model is as good as the data it simulates. This is why Reichle et al. rightly pride themselves about the good fit of the model's outcome with human data. The human data predominantly come from a reading study, reported by Schilling et al. (1998), in which 30 college students read 48 sentences. According to Figure 6 in the target article, the observed frequency effects in this study were roughly 70 msec for gaze duration, 30 msec for first fixation duration, and a 60% for word skipping rate. What Reichle et al. did not mention is that the Schilling et al. study was originally designed to look at the word frequency effect under very controlled circumstances (i.e., with words that were matched on all other variables except for word frequency, and with sentence context that constrained the target words equally). Each participant saw a number of sentences with low frequency words (2 per million) and a number of sentences with high frequency words (141 per million). These frequencies probably coincide with the frequency classes 1 and 5 of Figure 6 in the target article. If we look at the data reported by Schilling et al. for these particular stimuli, we obtain a frequency effect of 67 msec for gaze duration and 35 msec for first fixation duration, but only 4% for skipping rate ("Subjects fixated on HF words 89% of the time and on LF words 93% of the time" – Schilling et al., p. 1,272). That is, for this particular subset of well-controlled stimulus words, in Schilling et al., the effects for gaze duration and first fixation duration agree well with the overall data used by Reichle et al., but this is not true for the skipping rate. How come E-Z Reader "correctly" simulates a 60% difference in skipping rate between low-frequency and high-frequency words, whereas in the human data there was only a 4% difference attributable to word frequency?

After a review of all previously published word skipping data, Brysbaert and Vitu (1998) concluded that the frequency effect on word skipping is 4% on average (i.e., exactly the effect reported by Schilling et al., as well), and that the effect was 9% for contextual predictability (i.e., very predictable words in a sentence are skipped, on average, 9% more often than unpredictable words). In addition, they observed a 60% difference attributable to word length: 2-letter words are skipped more than 60% of the time, whereas 10-letter words are virtually never skipped in first-pass reading. To us, these data strongly suggest that what Reichle et al. simulate in the lower part of Figure 6 is not so much a frequency effect on skipping rate but a word-length effect on skipping rate. The authors themselves are clearly aware of this problem, because in Rayner et al. (1998c, p. 256, footnote 3), they wrote:

> In our modelling, to minimize the number of parameters, we did not distinguish between frequency and word length effects. Thus "frequency effects" in our model are really a combination of frequency and word length effects because the two are highly correlated in our sample of text as in printed English in general.

For this reason, we were very surprised to see that in the present article they still refuse to report the data separately for word length and word frequency, even though the current model is supposed to have a mechanism to deal with the effects of the length of the parafoveal word (see Equation 1 of the target article). What we ask is that Reichle et al. give us a figure in which the word-skipping rates of the Schilling et al. corpus are shown as a function of word length and word frequency, together with the predictions of E-Z Reader. If these provide a good fit, we will rest our case. However, we strongly suspect that the model will largely overestimate the effect of frequency and underestimate the effect of word length. For this reason, until proven wrong, we still believe that E-Z Reader is fundamentally flawed in its conception of interword behaviour in general and word skipping in particular.

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Reading the scene: Application of E-Z Reader to object and scene perception

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Abstract: We discuss five basic principles of E-Z Reader in terms of their potential for models of eye-movement control in object and scene perception. We identify several obstacles which may hinder the extrapolation of the E-Z Reader principles to nonreading tasks, yet find that sufficient similarities remain to justify using E-Z Reader as a guide for modeling eye-movement control in object and scene perception.

Eye-tracking has provided vision science with a powerful tool to unobtrusively monitor on-line perceptual and cognitive processing. Unfortunately, eye movement records generate a host of overt measures which all may (or may not) reflect some aspect of covert processing, leading to much debate about which measure would be most appropriate (e.g., Inhoff & Radach 1998). The most promising solution to this debate is to consider multiple eye movement measures simultaneously (Henderson et al. 1999). However, to do this, an integrated model is required that specifies the relations between the various overt measures as well as their correspondence to covert processes. This is precisely what Reichle et al. have achieved with E-Z Reader.

As users of eye-tracking methodology in object and scene perception, we can be only envious of this situation, yet at the same time Reichle et al. inspire some optimism with their suggestion that the basic principles of E-Z Reader may apply to other visual information processing tasks (sect. 4.9). We would like to evaluate the grounds for such optimism by examining five basic principles of E-Z Reader to determine whether and how they can be applied to the study of eye-movement control in object and scene perception.

First, according to E-Z Reader, the main engine of eye movements in reading is serial word identification. This makes sense given (a) the importance of individual word order and meaning to understand the whole sentence, and (b) the ease with which individual words can be segregated from a sentence. In scene perception, neither of these conditions is fulfilled. It is quite possible

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