Fragmented Visual Attention in Web Browsing: Weibull Analysis of Item Visit Times (Supplement)

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1 Introduction

This supplement accompanies the paper entitled 'Fragmented Visual Attention in Web Browsing: Weibull Analysis of Item Visit Times' in ECIR '23. Here, we present analysis of the results in Section 5 with different sizes assumed for the fovea. As explained in Section 3.5 of the main paper, the participants were allowed to sit 45-100 cm from the monitor. We used the average of this span to calculate the size of the foveal area. The fovea (central part of the retina) is assumed to span 2°of visual angle. Hence, we computed that the radius of the fovea is 48 px (the **'baseline'**). We assumed that if an item fell to the foveal area, this was taken into account in visitations. Thus, the larger the foveal area is assumed to be, the more items fall to it at any fixation, which may impact the results. We demonstrate the impact of additional foveal radii of 28 px and 66 px.

2 Results

We will report on both descriptive statistics and model fitting results with the two different foveal radii.

2.1 Foveal Radius of 28 px

First, we report on results when the foveal area is assumed to be smaller than the baseline at 28 px. That is, fewer items fit to this area at any fixation.

2.1.1 Descriptive Statistics

The mean visit durations remain higher in the single- than multi-column condition (1.3 s with $SD = 1.61$ vs. 0.70 s with $SD = 0.95$). The mean dwell times were also higher in the single-column condition (2.92 s with $SD = 2.77$

vs. 2.01 s with $SD = 1.90$). Approximately 60% of items were revisited in the single-column condition, and 70% in the multi-column condition.

2.1.2 Modelling Results

Here, we present Figures 3 and 4 from the paper, plotted for the foveal radius of 28 px. The qualitative interpretations presented in the paper hold. However, due to the change in the foveal area, there are some differences in the shapes of the survival and hazard functions.
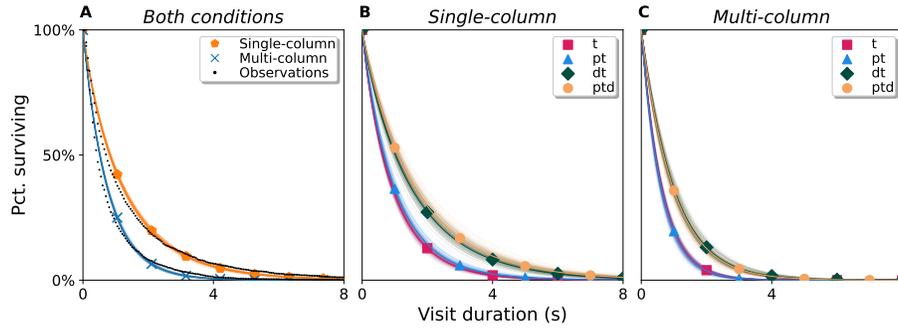

Figure 1: Survival functions when the foveal radius is assumed to be 28 px. The similarity of the t and pt conditions is accentuated in comparison to the baseline in the single-column condition (pane B). However, the qualitative interpretation that items with fewer details are visited for shorter durations holds.
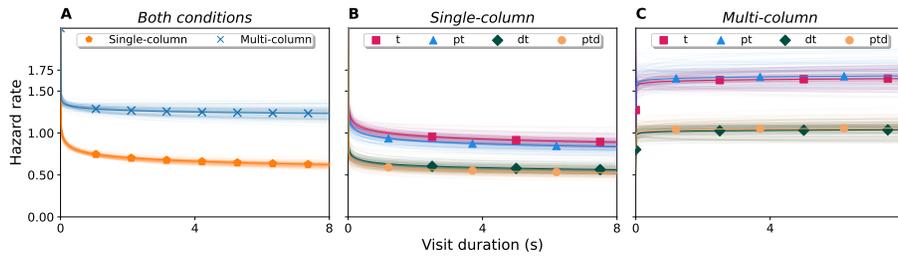

Figure 2: Hazard functions when the foveal radius is assumed to be 28 px. The multi-column condition displays some positive aging (pane C), which was also the case in the baseline.

2.2 Foveal Radius of 66 px

We also report on a foveal area that is larger than the baseline at 66 px.

2.2.1 Descriptive Statistics

Again, the mean visit durations are higher in the single- than multi-column condition (1.72 with $SD = 2.07$ vs. 0.90 with $SD = 1.13$). The same applies to mean dwell times, which are higher in the single-column condition (3.66 with $SD = 3.28$ vs. 2.97 with $SD = 2.49$). The number of items revisited stands at approximately 56% in the single- and 81% in the multi-column condition.

2.2.2 Modelling Results

Again, we present Figures 4 and 5 from the main paper for the foveal radius of 66 px. The differences between the covariates are less accentuated than in the baseline. However, the qualitative interpretation that the rate at which people switch focus of attention is higher in the multi-column condition and with items with fewer details holds here, too.
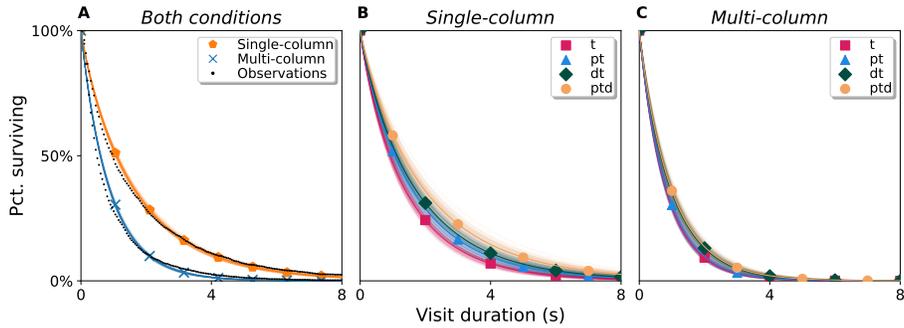

Figure 3: Survival functions when the foveal radius is assumed to be 66 px. The difference between the different covariates is less accentuated (panes B and C) than in baseline.
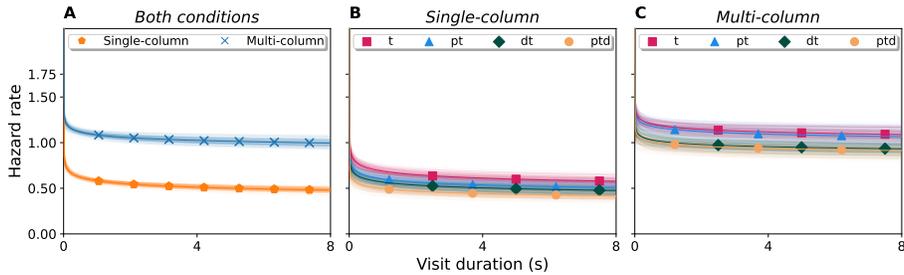

Figure 4: Hazard functions when the foveal radius is assumed to be 66 px. The shape of the hazard functions are similar to the baseline.

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3   Discussion

In this supplement, we have analyzed the impact of the choice of foveal radius on the presented modelling results. Based on this analysis, we concluded that the chosen foveal radius of 48px does not significantly affect the qualitative modelling results. That is, even though the absolute results can vary, the conclusions presented in the paper hold; visits tend to be shorter in the multi-column condition, and when items contain less information. Additionally, interpretation of the descriptive results still holds, even if the absolute values for different statistics may vary based on the foveal area.