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Interdependence and Past Experience in Menu Choice Assessment

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Introduction

During goal-directed menu search the user assesses the relevance of an item to their goal and then has a choice between selecting the current item or continuing to assess the remaining items in the choice set. An obvious influence on selection is the relevance of the goal label to the task description (Franzke, 1995). Interestingly, Young (1998) has proposed that there is interdependency between the assessments of each item. Previous models, in contrast, have tended to assume that assessments were independent. A novel prediction to emerge as a consequence of Young's normalization assumption is that the relevance of the distracter items to the search goal will affect the decision to terminate a search and select an item. More specifically, the assumption predicts that the presence of lower relevance distracters will result in fewer items being assessed.

Another potential influence on the decision to select an item or assess further items is the history of previous experience. In problem solving tasks Lovett and Anderson (1996) have shown that an operator is more likely to be selected if it was previously successful. In menu selection it is an open question as to whether previous history of evaluation leads to more or less evaluation.

The aim of the present study was to demonstrate that the decision to select an item is not simply determined by the relevance of the goal item to the search goal, but is strongly influenced by the relevance of the remaining distracter items and by past experience.

Method

The menu search tasks used were derived from responses to a web usage survey posted to undergraduate students at Cardiff University. The quality of items was rated to assess the degree to which an item was relevant to the achievement of the search goal. A 2x2 mixed design was used with the difficulty of previous trials as a between-subjects factor and quality of distracter items as a within-subjects factor. Trials were split between filler and critical trials, with most of the filler trials occurring in the initial half of the experiment. Filler trials were used to manipulate the success rate of participants first selection. Participants ($n=36$) were native English speakers. Eye-tracking was performed using an ASL Pan/Tilt optic eye tracking system. The focus of the study was on eye-tracking data for the critical trials, which all participants completed. On the critical trials the distracter items were either moderate or very bad in quality, with the quality of the goal item being approximately equal.

Results and Discussion

We analysed the number of items (AOIs) that were fixated after the goal item had been fixated on critical trials in which the participant accurately selected the goal item on the first selection (see Figure 1). There was a significant main effect for both the quality of distracter items ($F(1, 34) = 25.48, p < .001$) and difficulty of the previous trials ($F(1, 34) = 4.27, p < .05$). There was no interaction.

The findings suggest that the choice between continued assessment and selection in menu search is not entirely determined by the relevance of the goal item to the search goal, but is also determined by the relevance of the assessed distracter items. This finding provides empirical support for the idea that assessments of menu items are interdependent. The choice between evaluation and selection was also found to be affected by past experience, a finding that cannot be accounted for by previous models of menu search.

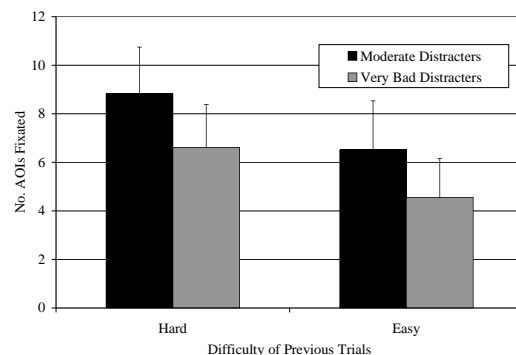


Figure 1: The effect of quality of distracter items and difficulty of previous trials on the number of AOIs fixated after the goal was fixated (error bars +/- 1 standard error)

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