A Good Image: A Study of Images as Information Cues in Online Search

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How do images affect the on-line search process? Information foraging theory states that individuals rely on informational cues presented to estimate the relevance of information sources and adapt their search behaviour by focusing on sources perceived to be more relevant (information scent - Pirolli and Card 1999). We research the interaction of images relative to key words, rank order and text in search engine result pages culminating in a selection.

An image of a product provides information to consumers when they relate expected product attributes to the image (Scott and Vargas 2007). When an information source is perceived to be relevant based on the cues associated with it, according to spreading activation theories of human memory (Anderson 1993), an activation mechanism occurs which spreads from one cognitive structure to another linked structure.

Consumers typically use keywords related to product attributes to initiate their online search. Cognitive activation occurs when the consumer finds an image that matches the search key word (Scott and Vargas 2007). A high level of match between an image and a keyword is more likely to lead to activation, leading to greater amount of cognitive processing. Hence, we hypothesize a positive relationship between image keyword match and cognitive processing of an image (H1). The activation caused by the image-keyword match may provide enough confirmation that the product associated is worth further evaluation and the link to the product detail page needs to be selected to collect additional information (H3).

Rank order of search results is perceived indicative of relevance (e.g. Joachims et al. 2005) with the first results receiving more attention. When an image with a high level of match to a keyword appears on the top of the results page, it is more likely to be noticed and processed. When this image appears lower, it is less noticed and cognitively processed. We posit that rank order moderates the relationship between image keyword match and cognitive processing of the image (H2).

However, when activation from one cue (i.e. image-keyword match) is not strong enough to make the individual believe s/he should directly go to the product detail page, s/he may rely on a secondary cue (i.e. textual summary of the product listed in the search result). And the summation of activations from both image-keyword match and textual summary needs to be strong enough to trigger a link selection action (Pirolli and Card 1999). We hypothesize that cognitive processing of the image is more likely to lead to cognitive processing of the textual summary (H4). In addition, more cognitive evaluation of the textual summary is more likely to lead to product link selection (H5).

Figure 1. Research Model
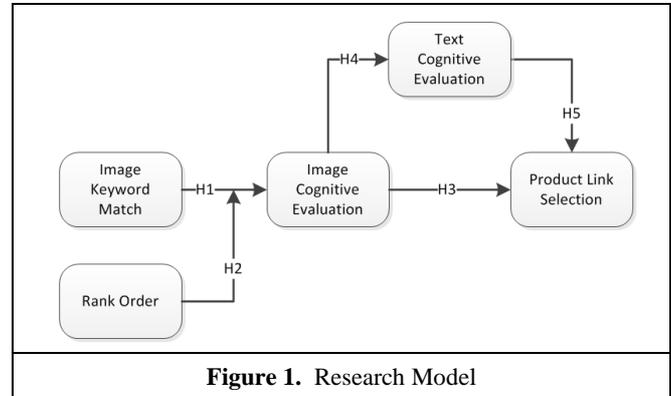
The experiment adopts a two (low vs. high image keyword match) by two (low vs. high rank order) within subject design. A mock online bookstore is used where subjects search using four keywords across multiple topics. Based on the search result, they select a book for further evaluation on the book detail page. We collect subjects' responses on product link selection and physiological data (e.g., eye movements, pupil dilation (PD), Galvanic Skin Resistance (GSR), and heart rate (HR)) to capture real time cognitive information that is more reliable than self-report subject response and poses little interruption to the subject's search effort. Post-experiment surveys and interviews will be conducted to further validate the findings. Our results will be presented at the 2012 Gmunden Retreat on NeuroIS.

Construct	Operationalization
Product Link Selection:	Act of selecting a link to evaluate a product.
Image-Keyword Match:	Judges to evaluate images relative to keywords.
Cognitive Evaluation of Image:	Eye tracking associated with image – Gaze duration/ pupil dilation - GSR with Heart Rate
Cognitive Evaluation of Text	Eye tracking data associated with text – Gaze duration/ pupil dilation - GSR with Heart Rate
Rank Order:	Experimental website with predetermined rank order listing of search results for selection
Controls:	Image Characteristics: High Contrast, Simple Composition Consistent SERP presentation

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