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Adaptive Information Indexing in Re-finding Information

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Abstract: We studied how the human cognitive system adaptively performs information indexing (i.e. knowing where to re-find information without necessarily knowing the information content). Participants searched for information using computer icons with or without locations or luminance cues. The cues represented the history of use of icons and were calculated using the ACT-R memory equation. Results suggest that participants adaptively used the location/luminance cues to offload information indexing from internal memory to external cues. Availability of location cues led to more frequent icon accesses and worse recall of icon titles. Availability of luminance cues led to worse recall of icon titles and locations. Participants adapted to the cost-benefit structure of the environment by strategically shifting the use of different kinds of external cues based on their relative access costs. Results highlight the dynamic interplay between external representations and human information processes in shaping adaptive interactive behavior in information search and indexing.