

When does visual search move on?: Using the color wheel to measure the dynamics of foraging search

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When foraging for multiple instances of a visual target, can observers begin to search for the next item before collecting the current target or must they complete the current search first? To answer this question, we examined the temporal dynamics of foraging search using a novel dynamic color technique. Observers searched for 2–16 Ts among 9–23 Ls while all items continuously varied independently in color. The trial terminated after a pseudorandom number of targets had been clicked. At that point, observers were shown a color response palette and asked to report either the color of the "Current" target they had just clicked or the "Next" target they intended to click. The difference between the observers' color response and the actual color of the item at the end of the trial gives an estimate of the time (relative to the end of the trial) when they found the target. If observers were guessing, color distributions would be uniformly randomly distributed. However, distributions for Current and Next trials were narrower than those expected by random guesses, indicating that observers were able to report the color of the Next item on some proportion of the trials. Observers' color responses were also consistent with sequential acquisition of the targets. Average responses for Current targets corresponded to colors shown 330 ms before the end of the trial, while average responses for Next targets occurred 174 ms before the end of the trial. As targets become sparser, it takes longer to find the Next target and, thus, reports of the color and location of the Next item become increasingly random since the next item has not been found. The results show that observers are actively searching for and finding the Next target before they finish collecting the Current target.

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