

Understanding Visual Search and Foraging in Cognitive Development

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How does visual search behavior change during development? We tested children using a standard visual search task (as has been done before e.g. Hommel et al., 2004) as well as a novel “Hybrid Foraging” task. In Hybrid Foraging, observers collect multiple instances of multiple types of target. For example, observers might pick all the blue and green squares in a display containing red, yellow, blue, and green squares (c.f. Kristjánsson et al., 2014). Hybrid foraging would seem to involve a richer set of attentional and executive functions than does a standard search task, and it has never been tested in children. 76 children, ages 6 to 10 were tested. All showed typical development as measured by several questionnaires/tests (BRIEF, CPT, BASC & RIST). Children ran a “Pirate-Treasure” Conjunction search, as well as two hybrid foraging “Hunting” tasks: Feature foraging (blue & green squares, among red and yellow distractors) and Conjunction foraging (green circles & blue squares among blue circles and green squares). Results show that RT decreases as a function of age for search and foraging tasks ($p < .001$). As usual, target absent RT x setsize slopes are steeper than target present ($p < .001$). Interestingly, the ratio of absent to present slopes seems to be larger in younger children ($p = .02$). This suggests that children may have different search termination rules. In the Hybrid foraging, it is interesting to ask about ‘runs’ of target selections. Do observers tend to pick the same target repeatedly or do they switch randomly between target types? The RT cost for switching to a new target is greater for younger observers, especially for the Conjunction task ($p = .02$). Moreover, younger children had a greater proportion of run trials ($p = .009$). Both VS and the new hybrid foraging paradigm appear to be useful tools for investigating the development of executive functions.