**Trade-off between search costs and accuracy in a visual and manual search task**  
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Humans must balance the influence of different factors when making decisions between multiple courses of action. For example, we recently demonstrated that humans trade-off their individual accuracy to discriminate object features against the prospective temporal costs of eye movements, required to locate an object, in order to optimize performance in a visual search task (Wagner et al., 2022). Here we tested if this trade-off is specific for eye movements, or if it generalizes to manual actions.

Participants were instructed to find one of two available targets in two intermixed sets of distinct elements, and to discriminate a feature at that target. The targets differed in two aspects: their relative search costs, manipulated by varying the relative number of distractors in the two sets, and their relative difficulty of feature discrimination. Correct/incorrect discriminations were rewarded/penalized monetarily, and participants were free to choose which target to search and report. Participants were given 6:30 min to gain as much reward as possible. We compared participants’ behavior and performance in two conditions: one required visual search via eye movements, whereas the other required manual search via taps on a tablet computer.

We found that participants traded-off the discrimination accuracy and search costs of target options to maximize expected value in both conditions. However, behavioral analysis and computational modelling revealed that performance in the visual search task was more strongly constrained by noise in decisions about what target to search for and what information to sample while searching for the chosen target.

We conclude that the previously reported near-optimal trade-off between search costs and discrimination accuracy constitutes a general strategy for humans to optimize decision-making behavior. However, the slower time course of manual actions makes choice behavior less suspectable to noise, compared to fast-paced eye movements.

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