Your hidden capacity revealed! The Multiple Object Awareness (MOA) paradigm.

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Most of previous studies of position tracking, identity tracking or change tracking produce capacity estimates in the limited range of 2-4 items. However, the standard design of these experiments systematically underestimates true capacity. Suppose, after monitoring a set of unique objects, all objects are hidden behind identical disks and you are asked, "Where was the cat?". In a standard experiment, if you click on the wrong item, you are simply wrong; but, if you knew that it was one of two or three items, evidence for that knowledge would be lost. To measure the capacity of this more diffuse Multiple Object Awareness (MOA), we asked observers to keep clicking until they found the target object. More specifically, observers were asked to track the identities of 16 unique cartoon animals. Using the Reciprocal Velocity Obstacle crowd simulation algorithm of VanDenBerg, et al (2011), animals moved continuously within an imaginary window without colliding with each other or with obstacles. After a random tracking interval of 7-20 sec, all animals stopped and were hidden by grey discs. A target animal was designated and observers were instructed to click on disk until they uncovered the target location. Then, observers clicked again, restarting the motion and continuing the same tracking task. Classic identity tracking capacity was calculated by analyzing the accuracy of the first click. This yielded a sensible K = 2.68. Multiple Object Awareness (MOA) is calculated from the total clicks needed to discover the target. Random guessing would require clicking half the objects, on average. In fact, observers need fewer clicks, consistent with K = 6.6. We believe that MOA gives a more accurate (and optimistic) estimate of how much observers know about the locations of objects in dynamic scenes.