Young children monitor the quality of visual working memory representations
Supplementary Materials

Betting Introduction Script

The experimenter points to the two jars on the table and says, "See these two jars? Right now, they both have the same amount of [resources]. Do they look the same to you? Yes, they're the same. Which of these do you want to be your jar?" After the child points to a jar, the experimenter says, "Okay so this jar is going to be yours." Then she takes out a white dry erase tag and continues, "I'm going to write a [initial] for [child's name] on this tag and put it on your jar so everyone knows this jar belongs to you." Then the experimenter takes out a tag with a piggy bank image on it and while placing it on the other jar says, "and this other jar, this is going to be the lab bank." The experimenter continues, "So, all these [resources] in your jar, they're yours to take home and keep! But first, I want to give you a chance to earn more [resources] to add to your jar."

The experimenter then explains, "We're going to play a game. I'm going to hide some different beads in different spots in a box and then I'm going to ask you to remember where I hid them. Then you get to place a bet. So let me show you how betting works." The experimenter brings out the 3 white tokens and explains, "You can choose to bet up to 3 [resources] on each turn. We will use these tokens as pretend when we make our bets but real [resources] will go in the jars."

The experimenter continues, "So if you tell me your answer and you are super duper sure that you are right then you should choose to bet all 3 [resources] on that turn. That way, if you're right, 3 [resources] will go from the bank's jar into your jar." The experimenter demonstrates what this transfer would look like. She then says, "but, you should only bet 3 when you are super duper sure because if you bet 3 and you're wrong, then 3 [resources] will have to go from your jar into the bank's jar." The experimenter again demonstrates this transfer.

Next the experimenter says, "If you're pretty sure about your answer then you should bet 2 [resources] on that turn. That way, if you're right, 2 [resources] will go from the banks jar into your jar. The experimenter demonstrates what this transfer would look like. She then says, "but, if you bet 2 and you're wrong, then 2 [resources] will have to go from your jar into the bank's jar." The experimenter again demonstrates this transfer.

Then the experimenter explains, "If you're only kind of sure about your answer then you should bet 1 [resource] on that turn. That way, if you're right, you still get 1 [resource] added to your jar. The experimenter demonstrates what this transfer would look like. She then says, "but, if you bet 1 and you're wrong, then you only have to lose 1 [resource]." The experimenter again demonstrates this transfer.

Finally the experimenter says, "Last, if you are really not sure about your answer – like if you were just guessing but you really don't know – then you should choose not to bet any [resources] on that turn. That way, if you're wrong you won't have to lose any [resources]. But, if you're right you won't get any either."

The experimenter says, "Does that make sense? Okay, Let's try one for practice."

Experiment 1: Single Feature
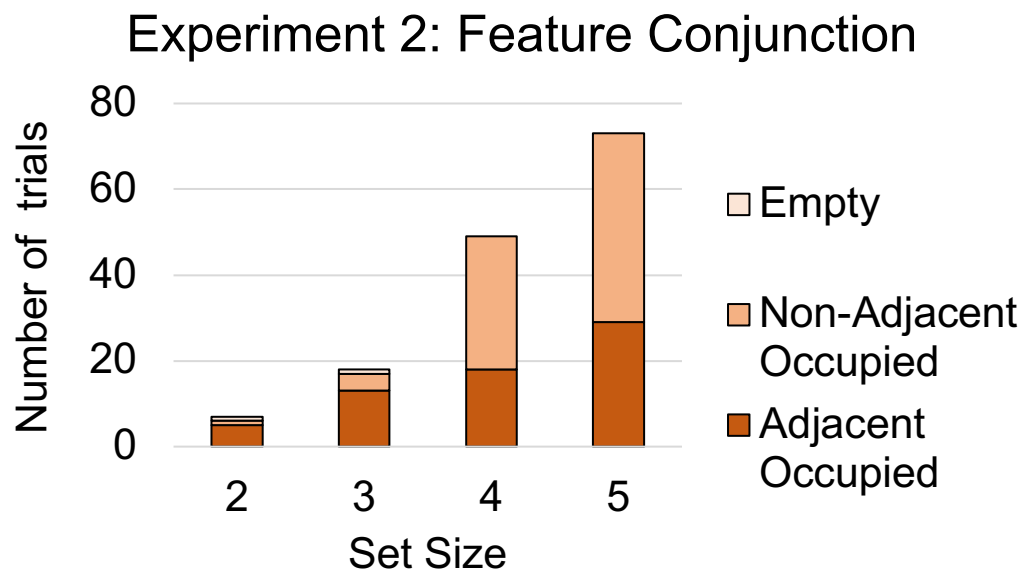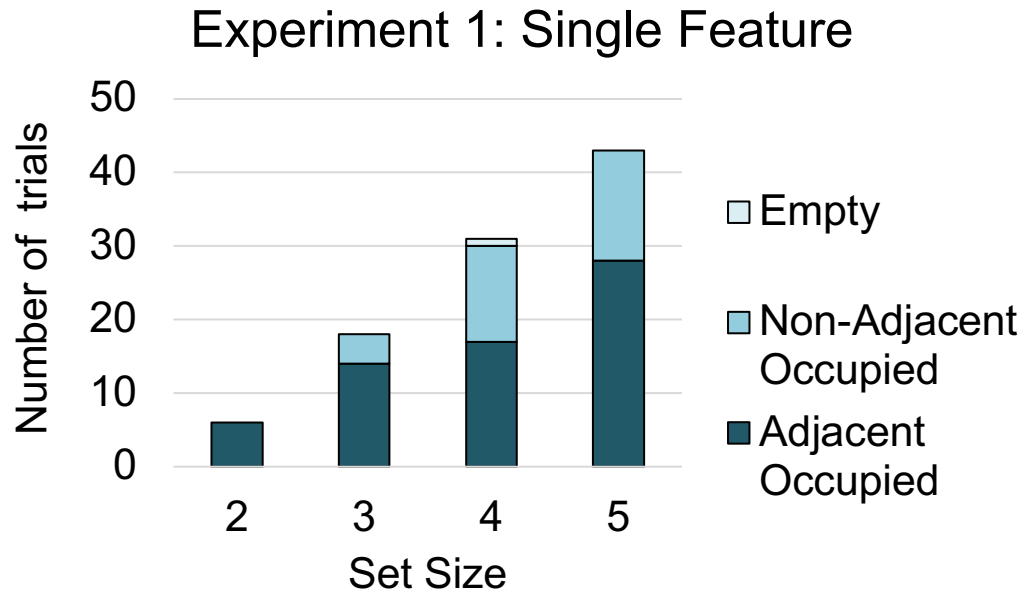

Experiment 2: Feature Conjunction

Figure S1. In Experiment 1 (top panel) and Experiment 2 (bottom panel), the number of incorrect trials on which children selected either an occupied location adjacent to the probe's actual location, an occupied location not adjacent to the probe's actual location, or an empty location.

Exploratory Analysis: Distance from Target and Children's Bets

We asked whether children were more confident in their responses when they selected incorrect locations adjacent to the target location versus incorrect locations that were not adjacent to the target locations. We conducted this analysis only for Set Size 4 and 5 trials, in which there was sufficient variability in children's patterns of errors. We observed no correlation between "near" and "far" misses and children's bets, controlling for Set Size, in either Experiment 1 (r = -.077, p = .516) or Experiment 2 (r = -.030, p = .777). In Experiment 2, children's bets also did not correlate with whether they chose a non-target that shared color, shape, or no features with the target object, controlling for Set Size (r = -.036, p = .733).

Table S1. Expected and observed distributions of errors in Experiment 2. Children completed 3 trials for each Set Size. For trials on which an odd number of objects were hidden, the probe shared color and shape with different numbers of objects across trials. For example, on a Set Size 3 trial, children may have observed an array consisting of a yellow round bead, an orange round bead, and an orange square bead, and were then probed on the location of the yellow round bead. On this trial, two objects were round and one was square; two objects were yellow and one was orange, and the probed object shared color with one object in the array and shape with the other object in the array. On a different Set Size 3 trial, children may have observed an array consisting of a red round bead, a red square bead, and a purple square bead, and were then probed on the location of the red square bead. On this trial, two objects were square and one was round, two objects were red and one was purple, and the probed object shared color with one other object in the array and no features with the other. We therefore computed the distributions of children's choices that would be expected if children were selecting non-target objects at random, given the true frequencies of these choices across trials at each Set Size.

	Selected Same Color		Selected Same Shape		Selected No Shared Features		Statistics	
Set Size	Expected	Observed	Expected	Observed	Expected	Observed	Chi2	p
3	4.8333	9	11	13	6.1666	0	10.122	.006
4	15	11	15	25	15	9	10.133	.006
5	10.75	14	15.8333	15	16.4166	14	1.382	.5