Session Description

Pre-training sessions:

Such sessions are the same across all the tasks.

Habituation_1: On Day 1, mice are placed in the testing chambers for 10 minutes with the house lights off, with no stimuli displayed and no reward presented.

Habituation_2: On Days 2 - 4, mice are placed in the testing chambers for 20 or 40 minutes with the reward tray light on, the reward is presented and paired with a sound (tone), and no stimuli is displayed.

Initial_Train: This phase involves pairing the reward with the presentation of stimuli on the touchscreen. After 30 seconds the stimulus is turned off and the illumination of the reward tray light is paired with a tone and delivery of the reward.

Must_Tocuh: This phase involves a stimulus displayed randomly, and the mouse is required to touch the stimulus on the screen in order to receive the reward paired with a tone.

Must_Initiate: In this phase, at the beginning of each trial, the reward tray is illuminated, and the mouse is required to initiate the stimulus delivery by a nose poke into the reward tray. Successful initiation extinguishes the tray light, and a stimulus is presented.

Punish incorrect: This session requires the mouse to both initiate and touch the stimulus but if an incorrect choice is made, it receives a 5s timeout, during which the lights are turned on and no reward is delivered.

PD Task:

Acquisition: In this task, mice must initiate the trials by poking their nose into the reward tray after a light signal is displayed. Immediately after exiting the reward tray, two different images appear on the screen, and mice are required to learn that a rewarded response is determined by the correct visual image.

Baseline: Following the achievement of acquisition criteria, each mouse was subject to two baseline sessions according to the same schedule used for the acquisition sessions. However, there is no criterion required to pass this stage.

Reversal: After completion of the baseline sessions, each mouse is subject to daily sessions to assess reversal learning and cognitive flexibility. The contingencies between stimuli and reward were reversed. There are no performance criteria for reversal sessions.

Re-reversal: This session is the same as **Acquisition**, but it must be performed after **Reversal** sessions.

PAL Task:

Acquisition: In this task, mice must initiate the trials by poking their nose into the reward tray when the feeder's light turns on. Then, two different images appear in two of three positions on the screen, and mice must learn that each specific visual image is associated with only one correct spatial location on the touchscreen, and only one image per trial is presented in the correct location.

Mouse_dPAL_SPAL: This session must be performed after PAL Acquisition, and mice are tested on different PAL (dPAL) or on same PAL (sPAL) tasks.

5-Choice Task:

Training: This session is performed at the first time point the mice are tested. At this training phase the mice are trained at 4s stimulus duration until they meet pre-stablished criteria: accuracy >80%, omission <20 %, for 3 consecutive days. Once mice reached criteria, training continued on the same task, but with a 2s stimulus duration; criteria for this phase were the same as for the 4s version

Probe: During each probe session, basically one of four test stimulus durations was used: 1.5 s, 1.0 s, 0.8 s, and 0.6 s (sometimes shorter stimulus duration can be used e.g. 0.4, 0.2 seconds). Each mouse should complete two consecutive days of probe trials with each of the stimulus durations. For the probe sessions there is no criteria to be met.

Intra-probe: Following each probe sessions with a stimulus duration, mice are returned to the 2-s stimulus duration version for two consecutive baseline days before beginning the next probe sessions with a different stimulus duration.

Re-Baseline: Mice can be tested at different ages/time points. Prior to the start probe sessions for the next age of experiment, mice are given 5-days of 2-s 5-CSRTT sessions in order to re-baseline them on the task.