

GLOSSARY

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MOUSEBYTES



Table of Contents

GLOSSARY	4
PRE-TRAINING SESSIONS	
Habituation_1	4
Habituation_2	4
Initial_Train	4
Must_Touch	4
Must_Initiate	5
Punish Incorrect	5
5-CHOICE (5C)	
Purpose	5
Key Features	6
Sub-Tasks	7
IMAGE CONTINUOUS PERFORMANCE TASK (iCPT)	
Purpose	7
Key Features	7
Sub-Tasks	9
LOCATION DISCRIMINATION (LD)	
Purpose	10
Key Features	10
Sub-Tasks	10
PAIRED-ASSOCIATES LEARNING (PAL)	
Purpose	11
Key Features	11
Sub-Tasks	12
PAIRWISE VISUAL DISCRIMINATION (PVD/PD)	
Purpose	12
Key Features	12
Sub-Tasks	13
PROBABILISTIC REVERSAL LEARNING (PRL)	
Purpose	13
Key Features	13
Sub-Tasks	15
PROGRESSIVE RATIO (PR)	
Purpose	15
Key Features	15
Sub-Tasks	15

VISUOMOTOR CONDITIONAL LEARNING (VMCL)

Purpose	16
Key Features	16
Sub-Tasks	17

GLOSSARY

This glossary provides information on the different types of cognitive tasks found on the MouseBytes website. For more information on touchscreen task and protocols, please visit the following link: <https://touchscreencognition.org/sops/>.

PRE-TRAINING SESSIONS

The pre-training sessions are the same across most of the cognitive 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.
- Key Features
 - **End Summary** – Final recorded values at the end of a session.
 - **Condition** – Total Session Length.

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 are displayed.
- Key Features
 - **End Summary** – Final recorded values at the end of a session.
 - **Condition** – Total Session Length.
 - **Trials Completed** – Number of trials completed.
 - **Reward Collection Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.

Initial Touch

- 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.
- Key Features
 - **End Summary** – Final recorded values at the end of a session.
 - **Condition** – Total Session Length
 - **Corrects** – Number of correct responses.
 - **Correct Touch Latency** – Reaction time between stimulus presentation and response to the illuminated window.
 - **Correct Reward Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.

Must Touch

- 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.
- Key features

- **End Summary** – Final recorded values at the end of a session.
 - **Condition** – Total Session Length.
 - **Corrects** – Number of correct responses.
- **Correct Touch Latency** – Reaction time between stimulus presentation and response to the illuminated window.
- **Correct Reward Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.

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.
- Key Features
 - **End Summary** – Final recorded values at the end of a session.
 - **Condition** – Total Session Length.
 - **Corrects** – Number of correct responses.
 - **Correct Touch Latency** – Reaction time between stimulus presentation and correct response to the illuminated window.
 - **Correct Reward Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray

Punish Incorrect

- This session requires the mouse to both initiate and touch the stimulus but if an incorrect choice is made, there is a 5 second timeout, during which the lights are turned on and no reward is delivered.
- Key Features
 - **End Summary**– Final recorded values at the end of a session.
 - **Condition** – Total Session Length.
 - **Trials Completed** – Number of trials completed.
 - **Correction Trials** – number of trials completed after incorrect touch to make the correct response.
 - **% Correct** – Percentage of correct responses out of the total number of trials completed.
 - **Correct Touch Latency** – Reaction time between stimulus presentation and response to the correct illuminated window.
 - **Correct Reward Latency** – Number of correct entries into the reward collection tray to collect the reward.

5-CHOICE (5C)

Purpose

This task is also known as **5_CSRTT** (5 Choice Serial-Reaction time task). The main purpose of this task is to study attention and response control in rodents. This task requires responses to brief flashes of light pseudo-randomly displayed in one of the 5 response windows on the touchscreen chamber.

Key Features

- **Threshold** – Final recorded measure as of end of session.
 - **Condition** – Total Session Length.
 - **Accuracy %** – Percentage of trials where a correct detection occurred.
 - **Omission %** – Percentage of trials where no response was made.
 - **Trials** – Total number of trials.
 - **ITI** – Inter-trial Interval.
 - **Stimulus Duration** – Total length of stimulus presentation during trial.
- **Trial Analysis** – Data segmentation for every individual trial of session.
 - **Accuracy %** – Percentage of trials where a correct detection occurred.
 - **Omission %** – Percentage of trials where no response was made.
 - **Corrects** – Number of correct responses.
 - **Incorrect** – Number of incorrect responses.
 - **Omission** – No response in made.
 - **Premature** – Responses made to touchscreen area prior to stimulus presentation.
 - **Stimulus Duration** – Total length of stimulus presentation during trial.
 - **Time to Distraction** – Time between the onset of the stimulus and the onset of the distraction.
 - **Reward Collection Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.
 - **Correct Touch Latency** – Reaction time between stimulus presentation and response to the illuminated window.
 - **Incorrect Response Latency** – Reaction time between stimulus presentation and response to the non-illuminated windows.
 - **Correct Resp Latency with No Distract** - Reaction time between stimulus presentation and response to the illuminated window with no distractors present.
- **Grid 1, Grid 2, Grid 3, Grid 4, Grid 5** – Position of stimuli from 1 (most left) to 5 (most right).
- **Omissions**
 - **Total** – Total number of specific response.
- **Premature Response** – Responses made to touchscreen area prior to stimulus presentation.
 - **Total** – Total number of specific response.
- **Perseverative Correct** – Responses made to touchscreen during trial in a previously correct location.
 - **Total** – Total number of specific response.
- **Perseverative Incorrect** – Responses made to touchscreen during trial in a previously incorrect location.
 - **Total** – Total number of specific response.

- **Time-out Touches** – Responses made to touchscreen during a punishment period following incorrect response.
- **ITI Responses** – Responses made to touchscreen during the inter-trial interval.
- **Beam Break** – Frequency of infrared beam breaks in chamber during session.
- **Reward Collection Latency** – Reaction time between a correct response on the touchscreen and entry into the reward collection tray.
- **10 Trial Block** – Data segmentation for every 10 blocks completed during the trial.
- **Delay** – Total time between trial initiation and stimulus presentation

Sub-Tasks

1. **Training**

- Mice are trained at 4s stimulus duration until they meet pre-established criteria: accuracy >80%, omission <20%, for 3 consecutive days. Once mice reach criteria, training continues on the same task, but with a 2s stimulus duration; criteria for this phase are the same as for the 4s version.

2. **Probe**

- During each probe session, one of four test stimulus durations is used, typically 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.

3. **Intra_Probe**

- Following each pair of probe sessions, 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.

4. **Re_Baseline**

- Mice can be tested at different ages/time points. Prior to the probe sessions for the next time point, mice are given 5 days of 2-s baseline sessions.

IMAGE CONTINUOUS PERFORMANCE TASK (iCPT)

Purpose

The main purpose of this task is to assess various components of cognition, including focussed sustained attention, target discrimination, reaction time and impulse control. Further, task probes can be implemented to assess processes such as selective attention and distractibility, as well as probes to increase the difficulty of stimulus identification and discrimination. Mice are trained to selectively respond to one image type (target – S+), while withholding responses to all others when presented (non-targets – S-). The number of non-target images and target presentation probability differs between two task stages. Stage 3 includes one non-target presented at a 50% probability, while Stage 4 includes four non-targets presented at a 66% probability (33% probability of a target).

Key Features

- **Probe 1**

- **End Summary** – Final recorded values at the end of a session.
 - **Schedule Length** – 45 minutes maximum.
 - **Non-correction trials** – Correction trials occur after a response is made to a non-target image. Correctional trials continue until an animal correctly withholds a response to a non-target, after which target images are cycled back into the sequence.
 - **Hits** – Animal makes a correct response to the target image within the limited hold period (0.5s more than set stimulus duration). This is rewarded with milkshake delivery in the reward tray. An animal can make a maximum of 100 hits before the session is terminated.
 - **Misses** – Animal fails to make a response to the target image within the limited hold period. This behaviour is not punished or rewarded and is followed by the intertrial interval and subsequent stimulus presentation.
 - **Correct Rejections** – Animal correctly withholds a response to a non-target image throughout the limited hold period. This behaviour is not punished or rewarded and is followed by the intertrial interval and subsequent stimulus presentation.
 - **Correct Image** – Set as the target stimulus for the testing session. Previous publications have tended to set the “horizontal lines” image as the target.
- **Stage 2**
 - **End Summary** – Final recorded values at the end of a session.
 - **Schedule Length** – 45 minutes maximum.
 - **Non-correction trials** – see above.
 - **Hits** – see above.
 - **Misses** – see above.
 - **Correct Rejections** – see above.
 - **Correction Trial Correct Rejections** – Indicates the number of correct rejections an animal made when on correction trial loops throughout the session. These responses are not included in the end summary number of correct rejections.
 - **Correction Trial Mistakes** – Indicates the number of mistakes an animal made while on correction trial loops throughout the session. These responses are not included in the end summary number of mistakes.
 - **Stimulation Duration** – The stimulus duration period is the set time (s) that the stimulus is displayed on the touchscreen. This parameter may vary depending on the experiment requirements, but typically is set to 2s during Stage 3 and Stage 4.
 - **Limited Hold** – The additional 0.5s in which the animal can respond to the screen and record a response, despite the image being removed as the “Stimulus Duration” period has ended. For a response to be detected, the animal must respond to the screen within the “Limited Hold” period. This parameter varies with the “Stimulus Duration” setting, though is typically set to 2.5s in Stage 3 and Stage 4.

- **Correct Image** – see above.
- **Stage 3**
 - **End Summary** – Final recorded values at the end of a session.
 - **Schedule Length** – 45 minutes maximum.
 - **Non-correction trials** – see above.
 - **Hits** – see above.
 - **Misses** – see above.
 - **Correct Rejections** – see above.
 - **Correction Trial Correct Rejections** – see above.
 - **Correction Trial Mistakes** – see above.
 - **Stimulation Duration** – see above.
 - **Limited Hold** – see above.
 - **Correct Image** – see above.
- **Stage 4**
 - **End Summary** – Final recorded values at the end of a session.
 - **Schedule Length** – 45 minutes maximum.
 - **Non-correction trials** – see above.
 - **Hits** – see above.
 - **Misses** – see above.
 - **Correct Rejections** – see above.
 - **Correction Trial Correct Rejections** – see above.
 - **Correction Trial Mistakes** – see above.
 - **Stimulation Duration** – see above.
 - **Limited Hold** – see above.
 - **Correct Image** – see above.

Sub-Tasks

1. **Stage 1: Stimulus Touch**
 - The stimulus (white square) is displayed in the center window for 10s, and the mouse is required to nose-poke the stimulus to get the reward.
2. **Stage 2: Target Stimulus Touch**
 - The stimulus (only one target image) is displayed in the center window for 2s, and the mouse is required to nose-poke the stimulus to get the reward.
3. **Stage 3: One Target and One Non-Target**
 - A target image and only one non-target image are displayed pseudo-randomly at equal probabilities in the center window for 2s throughout the session. The mouse is required to nose-poke the stimulus to get the reward.
4. **Stage 4: One Target and Four Non-Targets**
 - A target image (at lower probability 33.33%) and four novel non-target images (at higher probability 66.66%) are displayed at the center window for 2s. The mouse is required to nose-poke the stimulus to get the reward.
5. **Probe 1: Variable Stimulus Duration**
 - Like stage 4, but the stimuli are presented at different stimulus durations.

6. **Probe 2: Variable Contrast Levels**

- Like stage 4, but the stimuli are presented at different stimulus contrasts.

7. **Probe 3a: Congruent Flanker**

- This probe includes the presentation of distractor images presented in the right and left window flanking the center image, and they are the same images as the center image (target). The mouse is required to nose-poke the target stimulus to obtain reward. Nose-pokes to the distractor images are recorded but do not end the stimulus presentation period or elicit any reward delivery.

8. **Probe 3b: Non-Congruent Flanker**

- This probe includes the presentation of distractor images presented in the right and left window flanking the center image, and they are different images to the center image (target). Normally the distractor images are the non-target stimuli used in the main task. The mouse is required to nose-poke the target stimulus to obtain reward. Nose-pokes to the distractor images are recorded but do not end the stimulus presentation period or elicit any reward delivery.

9. **Probe 3c: Non-Flanker**

- No-distractor trials are the same as normal stage 4 trials.

LOCATION DISCRIMINATION (LD)

Purpose

The main purpose of this task is to assess spatial pattern separation. After initiation, two white squares in different positions appear on the screen, and mice are required to learn that a rewarded response is determined by the correct side.

Key Features

Coming soon!

Sub-Tasks

1. **LD_1_Choice_Training**

- Mice initiate trials by poking their nose into the reward tray after a light signal is displayed. Immediately after exiting the reward tray, two lights in positions 2 and 5 (out of 6) appear on the screen, and mice learn to respond to the correct side.

2. **LD_1_Choice_Probe_Easy**

- Also called the Dissimilar condition. Stimuli are in position 1 and 6.

3. **LD_1_Choice_Probe_Hard**

- Also called the Similar condition. Stimuli are in position 3 and 4.

4. **LD_1_Choice_Reversal_Training**

- The same as “LD_1_Choice_Training”, but with the contingencies between stimuli and reward reversed.

5. **LD_1_Choice_Reversal_Probe_Easy**

- The same as “LD_1_Choice_Reversal_Probe_Easy”, but with the contingencies between stimuli and reward reversed.

6. LD_1_Choice_Reversal_Probe_Hard

- The same as “LD_1_Choice_Reversal_Probe_Easy”, but with the contingencies between stimuli and reward reversed.

PAIRED-ASSOCIATES LEARNING (PAL)

Purpose

The main purpose of this task is to investigate long-term object-location learning and memory. After trial initiation, two of three possible different images appear in two of three positions on the screen. Mice learn that each visual image is associated with only one correct location on the screen.

Key Features

- **Acquisition**
 - **End Summary**– Final recorded values at the end of a session.
 - **Condition** – Total Session Length.
 - **Trials Completed** – Number of trials completed.
 - **% Correct** – Percentage of correct responses out of the total number of trials completed.
 - **Incorrect Touches** – Number of incorrect responses made.
 - **12 Trial Block** – Data segmentation for every 12 blocks completed during the trial.
 - **Correct Touch Latency** – Reaction time between stimulus presentation and response to the illuminated window.
 - **Incorrect Response Latency** – Reaction time between stimulus presentation and response to the non-illuminated windows.
 - **Correct Reward Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.
- **dPAL**
 - **End Summary** – Final recorded values at the end of a session.
 - **Condition** – Total Session Length.
 - **Trials Completed** – Number of trials completed.
 - **Correction Trials** – Number of trials needed to elicit the correct response.
 - **% Correct** – Percentage of correct responses out of the total number of trials completed and determines accuracy of responses.
 - **12 Trial Block** – Data segmentation for every 12 blocks completed during the trial.
 - **Correct Touch Latency** – Reaction time between stimulus presentation and response to the illuminated window.
 - **Incorrect Response Latency** – Reaction time between stimulus presentation and response to the non-illuminated windows.
 - **Correct Reward Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.
- **Accuracy** – Number of correct responses made compared to total number of responses.

- **ITI Touches** – Screen responses made during the inter-trial interval.
- **Reward Collection Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.
- **Touches to Blank** – Screen responses made to blank location.

Sub-Tasks

1. **Acquisition**

- After trial initiation, two of three possible different images appear in two of three positions on the screen. Mice learn that each visual image is associated with only one correct location on the screen.

2. **Mouse_sPAL**

- This probe test, performed after PAL Acquisition, assesses the extent to which PAL had been learned using stimulus-location associations. On a given trial, two identical stimuli from the Acquisition stage are presented. The correct location is that in which the correct stimulus for that location is displayed.

PAIRWISE VISUAL DISCRIMINATION (PVD/PD)

Purpose

The main purpose of these two tasks is to investigate behavioural flexibility during the reversal sessions. After trial initiation, two different images appear on the screen. Mice learn to respond to the correct visual image (S+ correct image and S- incorrect image).

Key Features

- **Acquisition**
 - **End Summary** – Final recorded values at the end of a session.
 - **Condition** – Total Session Length.
 - **Trials Completed** – Number of trials completed.
 - **Correction Trials** – Number of trials needed to elicit the correct response.
 - **% Correct** – Percentage of correct responses out of the total number of trials completed.
 - **10 Block Trial** – Data segmentation for every 10 blocks completed during the trial.
 - **Correct Touch Latency** – The time between stimulus presentation and response to the illuminated window.
 - **Incorrect Response Latency** – The time between stimulus presentation and response to the non-illuminated windows.
 - **Correct Reward Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.
- **Reversal**
 - **End Summary** – Final recorded values at the end of a session.
 - **Condition**
 - **Trials Completed**
 - **Correction Trials**
 - **% Correct**

- **10 Block Trial** – Data segmentation for every 10 blocks completed during the trial.
- **Correct Touch Latency** – The time between stimulus presentation and response to a stimulus.
- **Incorrect Response Latency** – Reaction time between stimulus presentation and response to the incorrect stimulus.
- **Correct Reward Collection** – Number of correct entries into the reward collection tray to collect the reward.
- **Accuracy** – Number of correct responses made divided by the total number of responses and multiplied by 100.
- **ITI Touches** – Screen responses made during the inter-trial interval.
- **Reward Collection Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.

Sub-Tasks

1. **Acquisition**
 - Mice initiate 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 learn to respond to the correct visual image.
2. **Baseline**
 - Following the achievement of acquisition criteria, each mouse receives at least two baseline sessions according to the same schedule used for the acquisition sessions.
3. **Reversal**
 - After completion of the baseline sessions, each mouse is subject to daily sessions to assess reversal learning. The contingencies between stimuli and reward are reversed. Mice are typically run for a set number of sessions (e.g., 10).
4. **Re_reversal**
 - These sessions are the same as Acquisition, but it must be performed after Reversal sessions.

PROBABILISTIC REVERSAL LEARNING (PRL)

Purpose

The main purpose of this task is to assess sensitivity to valence (i.e., positive or negative) of feedback. Mouse should respond to two white square stimuli on the flanker positions of the 3-hole mask, where one was designated correct and the other incorrect. The middle opening always remained blank, and the correct response results in reward (milkshake delivery).

Key Features

- **Analysis**
 - **Whole Session Analysis** – Averaged across trials within a session.
 - **Optimal side chosen** – Correct side chosen regardless of reward delivery.

- **Reward Collection Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.
 - **Image response choice latency** – Reaction time between image presentation and image response.
 - **Number of Reversals** – Number of within-session reversals (defined as 5 consecutive correct touches).
- **Trial by trial analysis** – Each trial within a session.
 - **One trial** – Time to complete one trial.
 - **Trial type** – Left optimal choice or right optimal choice.
 - **Spurious feedback given** – False feedback given.
 - **Spurious with milkshake** – False reward delivery.
 - **Spurious no milkshake** – False without reward delivery.
 - **Optimal side chosen** – Correct side chosen regardless of reward delivery.
 - **Optimal side chosen with milkshake given** – Correct side chosen with reward delivery.
 - **Optimal side chosen without milkshake given** – Correct side chosen without reward delivery.
 - **Left chosen** – Left image chosen.
 - **Right chosen** – Right image chosen.
 - **Reward Collection Latency** – Reaction time between a correct response on the touchscreen and entry into the reward collection tray.
 - **Image response choice latency** – Reaction time between image presentation and image response.
- **Punish Incorrect**
 - **Whole Session Analysis** – Averaged across trials within a session.
 - **Optimal side chosen** – Correct side chosen regardless of reward delivery.
 - **Reward Collection Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.
 - **Image response choice latency** – Reaction time between image presentation and image response.
 - **Trial by trial analysis** – Each trial within a session.
 - **Reward Collection Latency** – Time between a correct response on the touchscreen and entry into the reward collection tray.
 - **Image response choice latency** – Reaction time between image presentation and image response.

Sub-Tasks

1. **Deterministic Reversal Training**

- This training phase is designed to allow the mouse to become familiar with within-session reversals. Each session requires the mouse to complete 90 trials in 60 min. A trial includes two white square stimuli on the flanker positions of the 3-hole mask, where one is designated correct and the other incorrect. The middle opening always remained blank. A response to the correct stimulus always results in milkshake delivery.

2. Probabilistic Feedback

- A response to the correct stimulus resulted in milkshake delivery 80% of the time and no milkshake delivery the other 20% (i.e., the same feedback as an incorrect response). Similarly, a response to the incorrect stimulus resulted in milkshake being withheld 80% of the time and milkshake delivery the other 20% (i.e., the same feedback as a correct response). The endpoint criterion was stable performance across 3 consecutive days.

PROGRESSIVE RATIO (PR)

Purpose

The main purpose of this task is to assess motivation. A 5-hole mask is used, with the white square box stimulus presented in the centre hole. All other holes remain blank. When multiple responding is required, a response results in the brief removal of the stimulus, accompanied by a click, and milkshake is delivered following the response that satisfies the task ratio.

Key Features

- **End Summary** – Final recorded values at the end of a session.
 - **Schedule Length** – Length of session.
 - **Trials Completed** – Number of trials completed.
 - **Breakpoint** – Number of stimulus responses required for the last completed trial prior to session completion or timeout (300 s of no response to stimulus).
 - **Number of target touches** – Total number of responses to the stimulus during the session.
 - **Number of blank touches** – Total number of responses to the non-stimulus openings (i.e., responses to the 2 opening on either side of the stimulus).
 - **Reward Collection Latency** – Reaction time between a correct response on the touchscreen and entry into the reward collection tray.
 - **Revised total response time** – Time spent to complete each trial (measured from the first response to the stimulus on a trial until reward delivery). Also known as the complement to the post reinforcement pause in that it corresponds to the time before and after post reinforcement pause (or final response required for the trial).
 - **Revised post reinf. pause (from first head entry after reward delivery until first screen touch)** – Latency to respond to the stimulus following reward collection for the previous trial. Measured from first head entry after reward delivery until first stimulus response for every completed trial, except for the first trial.

Sub-Tasks

1. **Multiple Responding Training FR-1**
 - One response to the stimulus results in reward delivery.
2. **Multiple Responding Training FR-2**
 - Two responses to the stimulus results in reward delivery.
3. **Multiple Responding Training FR-3**
 - Three responses to the stimulus results in reward delivery.

4. **Multiple Responding Training FR-5**

- Five responses to the stimulus results in reward delivery.

5. **Basic PR (PR4)**

- PR4 requires the mice to respond to the stimulus +4 times more than the previous trial. The session ends either after 60 mins or the mouse is inactive for 5 mins consecutively.

6. **Baseline FR-5**

- Five responses to the stimulus results in reward delivery.

7. **High Demand PR (PR8)**

- PR8 requires the mice to respond to the stimulus +8 times more than the previous trial.

8. **High Demand PR (PR12)**

- PR12 requires the mice to respond to the stimulus +12 times more than the previous trial.

9. **Uncapped FR-5**

- Immediately following the final day of high demand PR, mice are tested on uncapped FR-5 across 3 days. it requires the mice to complete as many trials as possible within 60 min. The purpose of uncapped FR-5 is to ensure that responding on PR sessions is not confounded by satiation effects.

10. **High Demand PR (PR4)**

- PR4 requires the mice to respond to the stimulus +4 times more than the previous trial. High demand PR4 is executed along with high demand PR8 and high demand PR12.

VISUOMOTOR CONDITIONAL LEARNING (VMCL)

Purpose

The main purpose of this task is to assess stimulus-response habit learning. Animals learn a conditional rule of the type “If visual stimulus A is presented, make motor response X; if visual stimulus B is presented, make motor response Y”.

Key Features

- **End Summary** – Final recorded values at the end of a session.
 - **Condition** – Total Session Length.
 - **Trials Completed** – Number of trials completed.
 - **Correct Trials**– Number of correct trials in a session.
 - **Incorrect Trials**– Number of incorrect trials in a session.
 - **Missed Trials** – Number of missed trials in a session.
 - **Correction Trials** – Number of correction trials in a session.
 - **% Correct** – Percentage of correct responses out of the total number of trials completed.
 - **% missed** – Percentage of missed trials.
 - **Left corrects-Correct to Left** – It is responses on the left that were correct.
 - **Right Correct-Correct to Right** – It is responses on the right that were correct.

- **Trial by trial**

- **Correct Touch Latency** – Latency to nose poke to the correct choice
- **Incorrect Touch Latency**– Latency to nose poke to the incorrect choice
- **Correct Reward Collection**– Time between a correct response on the touchscreen and entry into the reward collection tray

Sub-Tasks

1. **VCML Train**

- One of two discriminative stimuli to be presented pseudo-randomly in the central window (discriminative stimulus / Sample Phase). The mouse is required to make a nose poke to this discriminative stimulus, which results in the presentation of two white squares (the choice stimuli) in the left and right windows. Image A (SR) will require a following response to the right; image B (SL) will require a response to the left. Both discriminative stimuli are presented an equal number of times during a session.

2. **VCML Test**

- One of two discriminative stimuli to be presented pseudo-randomly in the central window (discriminative stimulus / Sample Phase). The mouse is required to make a nose poke to this discriminative stimulus, which results in the presentation of two white squares (the choice stimuli) in the left and right windows. Image C (SR) will require a following response to the right; image D (SL) will require a response to the left. Both discriminative stimuli are presented an equal number of times during a session.

NOTE: Both VCML Train and VCML Test employ the same protocols, however there are different images used for each sub-task.