Additional metadata for the dataset from: Pisupati, S*., Chartarifsky-Lynn, L*., Khanal, A., & Churchland, A. K. (2019). Lapses in perceptual decisions reflect exploration. *bioRxiv*, 613828.

Abstract:
Perceptual decision-makers often display a constant rate of errors independent of evidence strength. These "lapses" are treated as a nuisance arising from noise tangential to the decision, e.g. inattention or motor errors. Here, we use a multisensory decision task in rats to demonstrate that these explanations cannot account for lapses' stimulus dependence. We propose a novel explanation: lapses reflect a strategic trade-off between exploiting known rewarding actions and exploring uncertain ones. We tested the model's predictions by selectively manipulating one action's reward magnitude or probability. As uniquely predicted by this model, changes were restricted to lapses associated with that action. Finally, we show that lapses are a powerful tool for assigning decision-related computations to neural structures based on disruption experiments (here, posterior striatum and secondary motor cortex). These results suggest that lapses reflect an integral component of decision-making and are informative about action values in normal and disrupted brain states.

Additional Information:

The dataset (41.4 MB) is a .mat file consisting of rat behavioral (choice) data collected between June 2016 & June 2019. It is organized into separate fields for each experiment:

- Multisensory: Behavior on "standard" rate discrimination task (Raposo 2012) on visual, auditory and multisensory trials
- Neutral: Behavior on matched/neutral manipulation, with a "neutral" multisensory condition (Raposo 2012) interleaved into the standard task
- RewardMag: Behavior on one-sided reward magnitude manipulations
- RewardProb: Behavior on one-sided reward probability manipulations
- Inactivation: Behavior during muscimol inactivations of Secondary motor cortex (M2 or FOF) or posterior Striatum (pStr).
  This data can be accessed either split by training contingency or combined:
  "inactivationStd" or Standard contingency: High->Right, Low->Left,
  "inactivationRev" or Reverse contingency: High->Left, Low->Right,
  "inactivationAll" i.e. pooled across contingency on the basis of stimulus category associated with inactivation side e.g. "pStr – High" reflects a left inactivation for standard & a right inactivation for reverse contingency.

Each experiment is a 1xnRats struct array with the following fields:

- ratName
- controlDates: Range of dates included for baseline behavior
- mode: interpretation of date range: exclusive ("only") or start,end ("between")
- controlSummaryData: summary (across trials) data for baseline behavior, a 1xnConditions array containing stimulus rates (stimRates), number of trials per rate (nTrials), number of "High" responses per rate (nHighResponses), proportion of early withdrawals (propEarlyWithdrawal), mean time spent sampling stimulus (meanWaitTime), mean movement time (meanMoveTime)
- controlRawData: raw (trial-wise) data for baseline behavior, a struct containing nTrialsx1 lists concatenated across sessions, with every trial's stimulus condition (condition), rate (stimRate), sequence of short(1) or long(2) inter-event intervals in the auditory (audISIs)

or visual (visISIs) stimulus, logical flags for completed trials (completed), high responses by subject (highResponse) and rewarded trials (success), stimulus sampling time (waitTime) and movement time (moveTime).

- contingency: training contingency: Standard (High->Right, Low->Left) or Reverse
- dates, summary & raw data from reward manipulations (skewDates, skewSummaryData etc.) or neural manipulations (inactivationDates, inactivationSummaryData etc.)
- Manipulated side for reward manipulations (skewSide)
- Manipulated region (inactivatedRegion), type (inactivationType), dosage of muscimol (inactivationDosage) and comments about concentration (comments) for neural manipulations

Note: Data from individual subjects for each experiment/manipulation has also been pooled and stored in subjects named “metaRat”, which were used to generate average (across rat) curves & fits.