Additional metadata for the dataset from: *Odoemene, O., Pisupati, S., Nguyen, H., & Churchland, A. K. (2018). Visual evidence accumulation guides decision-making in unrestrained mice. Journal of Neuroscience, 38(47), 10143-10155*.

Abstract:
The ability to manipulate neural activity with precision is an asset in uncovering neural circuits for decision-making. Diverse tools for manipulating neurons are available for mice, but their feasibility remains unclear, especially when decisions require accumulating visual evidence. For example, whether mice' decisions reflect leaky accumulation is unknown, as are the relevant/irrelevant factors that influence decisions. Further, causal circuits for visual evidence accumulation are poorly understood. To address this, we measured decisions in mice judging the fluctuating rate of a flash sequence. An initial analysis (>500,000 trials, 29 male and female mice) demonstrated that information throughout the 1000 ms trial influenced choice, with early information most influential. This suggests that information persists in neural circuits for ~1000 ms with minimal accumulation leak. Next, in a subset of animals, we probed strategy more extensively and found that although animals were influenced by stimulus rate, they were unable to entirely suppress the influence of stimulus brightness. Finally, we identified anteromedial (AM) visual area via retinotopic mapping and optogenetically inhibited it using JAWS. Light activation biased choices in both injected and uninjected animals, demonstrating that light alone influences behavior. By varying stimulus–response contingency while holding stimulated hemisphere constant, we surmounted this obstacle to demonstrate that AM suppression biases decisions. By leveraging a large dataset to quantitatively characterize decision-making behavior, we establish mice as suitable for neural circuit manipulation studies. Further, by demonstrating that mice accumulate visual evidence, we demonstrate that this strategy for reducing uncertainty in decision-making is used by animals with diverse visual systems.

Additional Information:

The dataset 0.0137 GB (i.e. 137MB) is a .mat file consisting of a 1x29 structure array.
Each row of this array is data from one subject, containing fields with the following info:

-Subject ID
-Species
-Training contingency (standard or reverse)
-Raw choice data*
-Parameters and standard errors of model fits to a 4 parameter cumulative normal psychometric function (pmf), namely bias (midpoint), sensitivity (slope), lapse rate (upper asymptote) and guess rate (lower asymptote)
-Parameters and standard errors of model fits to a 4 parameter logistic choice model (based on Busse et. al 2011), namely weights on previous success, previous failure, current stimulus and an overall response bias.

*(Details below)
***Raw choice data** is a structure containing raw, trial-wise data (concatenated across sessions, with session IDs maintained). It consists of:

stimEventList, an nTrialsx1 cell array, with each cell containing a list of stimulus events that played throughout the 1s trial. Indicator variables (0 or 1) denote the presence or absence of events in 25 time-bins of 40ms each.

stimRate, an nTrialsx1 array containing the overall rate of stimulus events in each trial

subjectResponse, denoting the choices that the subject made. 1 denotes low-rate responses and 2 denotes high-rate responses

correctResponse, denoting the correct category of stimulus events based on a category boundary of 12 i.e. stimuli are high rate (correctResponse =2) if stimRate>12.

validTrial, a logical array that is “True” if the subject gave a valid response (1 or 2), and “False” otherwise (eg. early withdrawal, or did not choose)

success, a logical array that is “True” if subjectResponse = correctResponse

waitTime, the amount of time spent in the center port sampling the stimulus
moveTime, the amount of time between withdrawing from the center port and making a response in the side port.

sessionID, denoting the session that each trial came from
numSessions, denoting the total number of sessions concatenated for this subject.