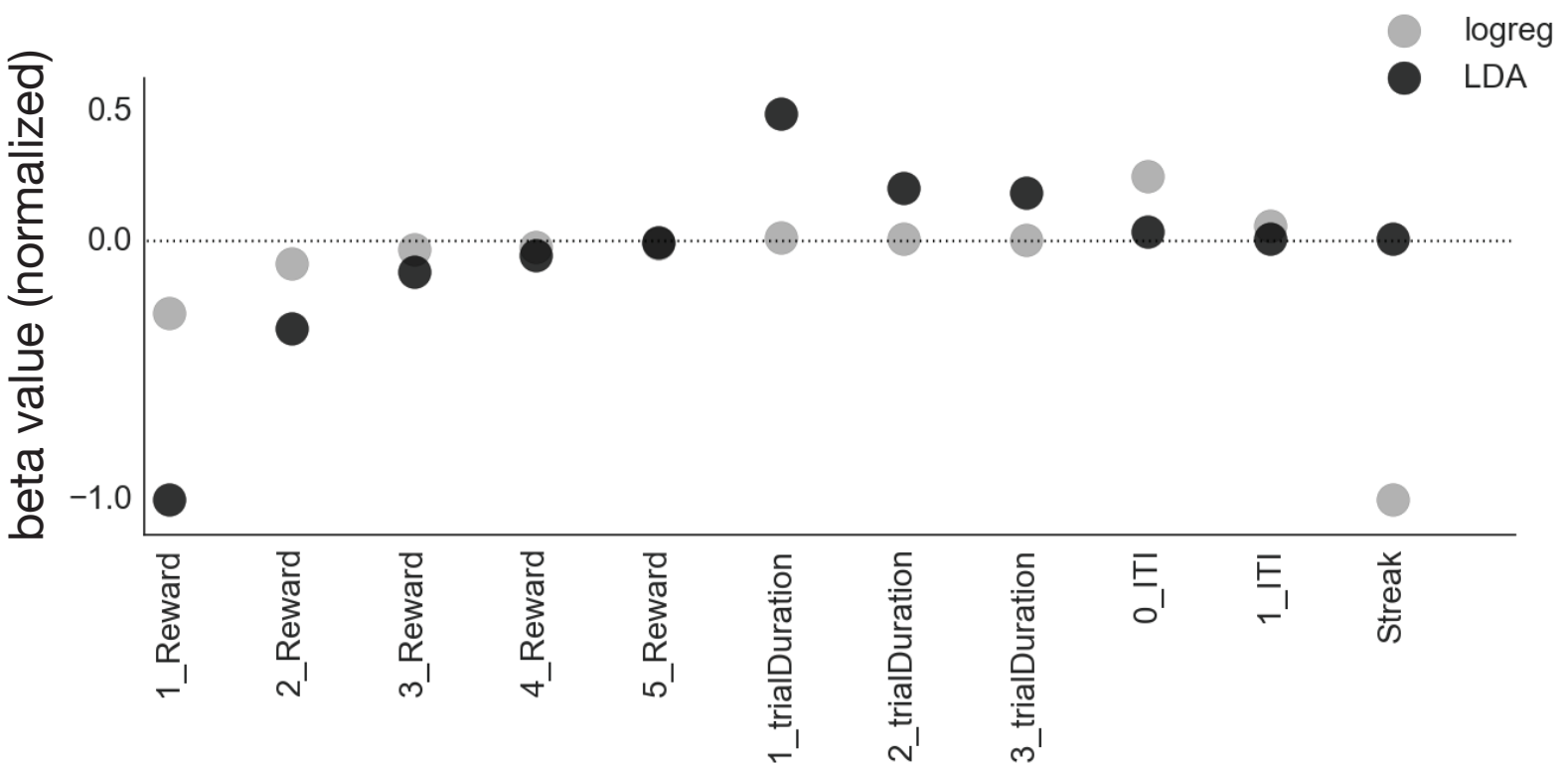


Interpreting the the model coefficients

Not surprisingly, all 3 models heavily depending on the previous reward outcome to predict a switch. Logistic regression fit a high beta to the 'streak' feature, whereas LDA did not. Conversely, LDA appeared to weigh rewards farther in the past more so than the logistic regression. In addition, the LDA used the 3 most recent 'trial durations' (a measurement of how fast the mouse performed the decision) - specifically, slower trial durations predicted switches (we have some hand-wavy intuition for this).

The models are clearly not performing with enough accuracy to make any claim that they are capturing the true strategy of the mouse. Nonetheless, these betas both confirm some of our own assumptions and offer a few interesting insights into how far in the past reward outcomes 'matter' when making a decision, as well as how the previous timing behavior of the mouse might be used to predict future decisions.



Decision Tree

As expected, 2 consecutive un-rewarded trials are the strongest predictor of a switch. However, this is also where the model fails - in reality, the mouse only switches ~25% of the time in this situation!

From staring at the mice performing the behavior, we've noticed that sometimes the mouse pauses for a considerable amount of time before deciding to switch. The decision tree seems to have picked this up!

