FUTURE WORK CONTD.

3. The current models are trained on young subject's data, so we will be using the selected model for the old subjects to compare the results and accuracy.

4. Coming to the raised question of how far ahead the young subjects are predicting compared to the old subjects we will train the selected model for 2 TR, 3 TR, . . . , upto 15 TR ahead prediction and compare the slopes of prediction loss and correlation.

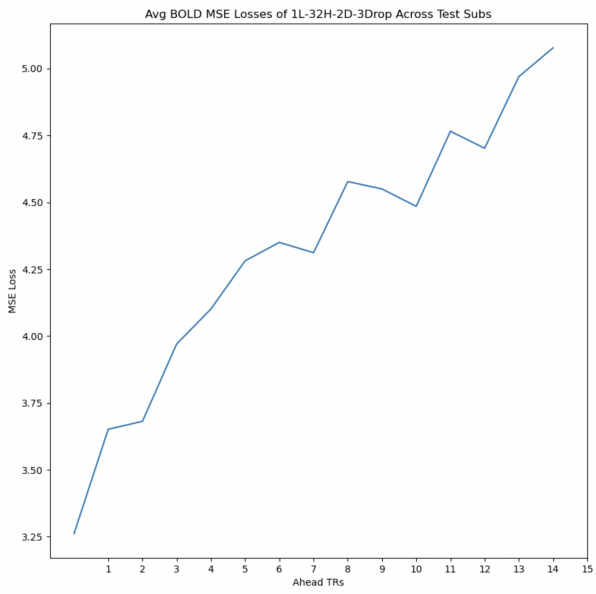
WORK:

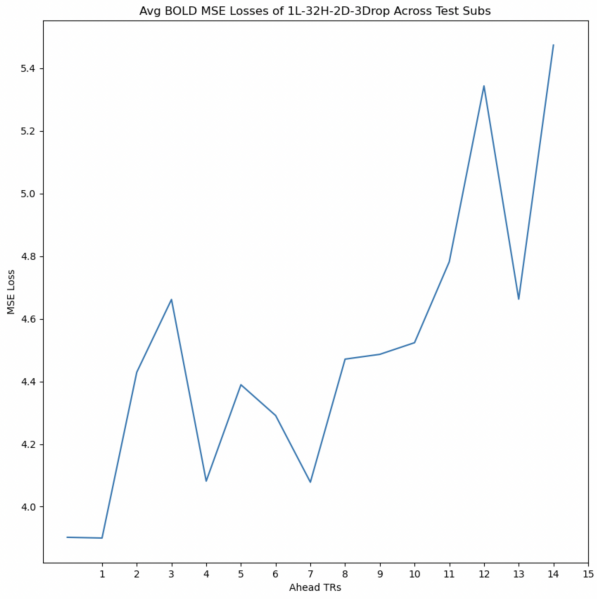
I modelled the BOLD values up to 15 TRs ahead for both young and old subjects. Below, I present the plots of prediction error and correlation of predicted BOLD values with the actual BOLD values for all these models for predicting BOLD values ahead of time. I only show the models for mOFC and lOFC. The other plots can be found here.

- We have around 10 test subjects, and we have individual results for each of them. Here I present the averaged result across all these subjects.
-

PREDICTION ERRORS:

- **mOFC**



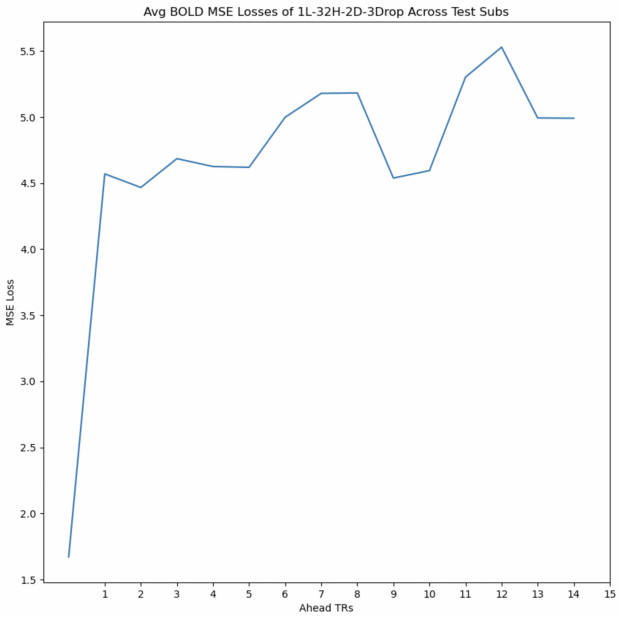


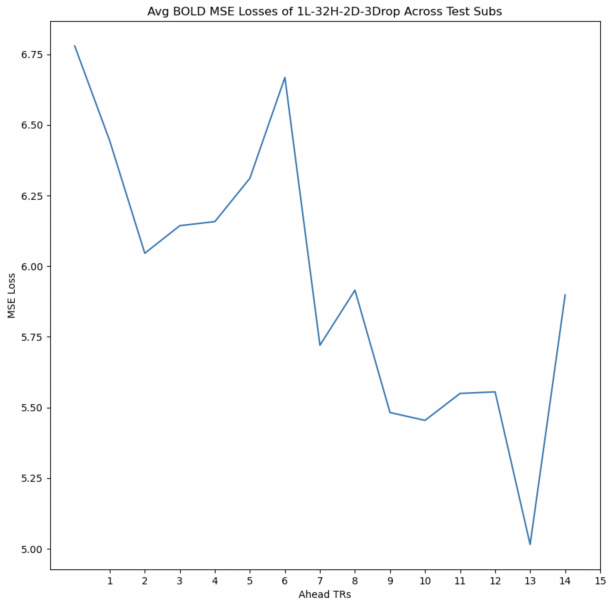
YOUNG

OLD

As expected, the loss increases as the time point ahead where the BOLD value is predicted increases. But the loss values for the OLD subjects are higher than the YOUNG subjects.

- **lOFC**



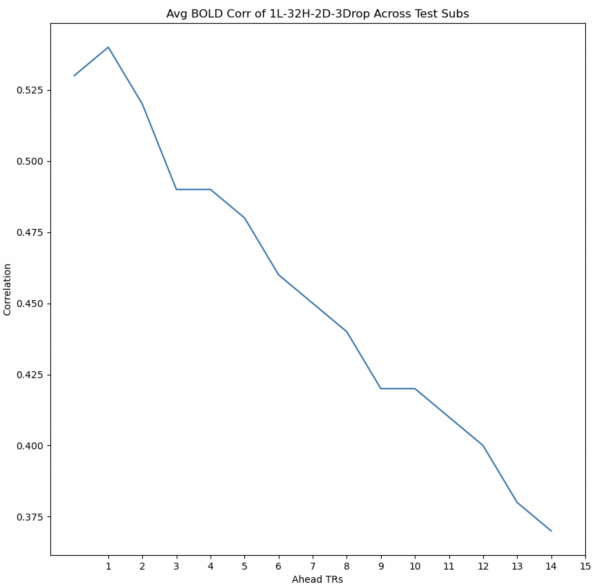


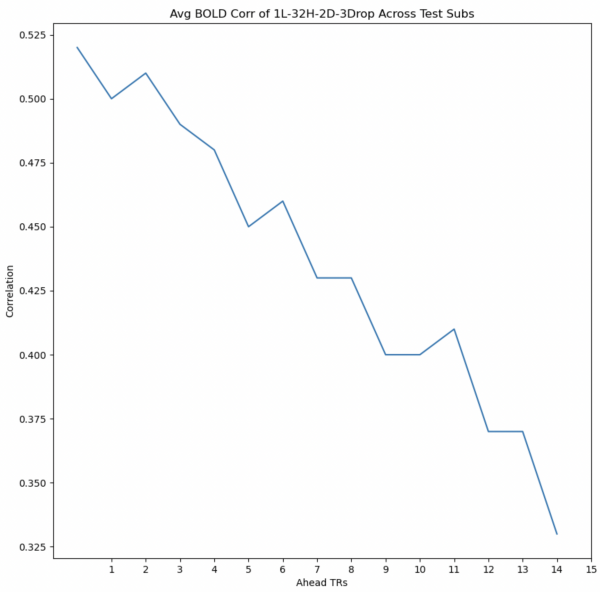
YOUNG OLD

Looking at the Y-axis you can see the error values are higher in old subjects like before. But the stark difference is prediction loss actually decreases as the time ahead when the BOLD values are predicted increases for the old subjects.

CORRELATION:

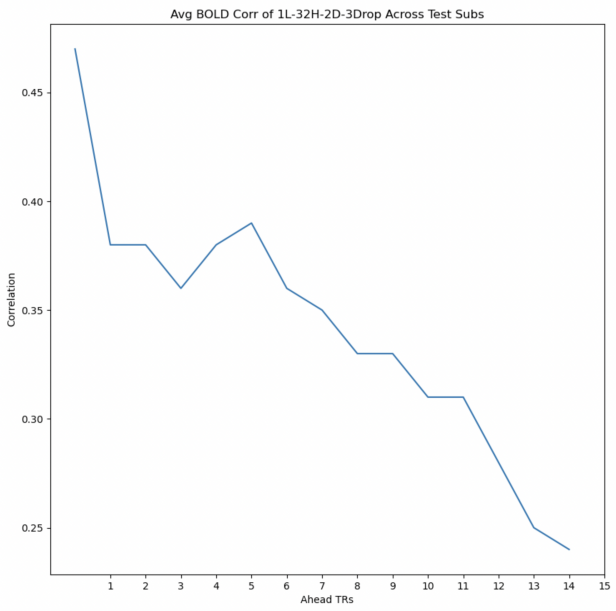
- **mOFC**

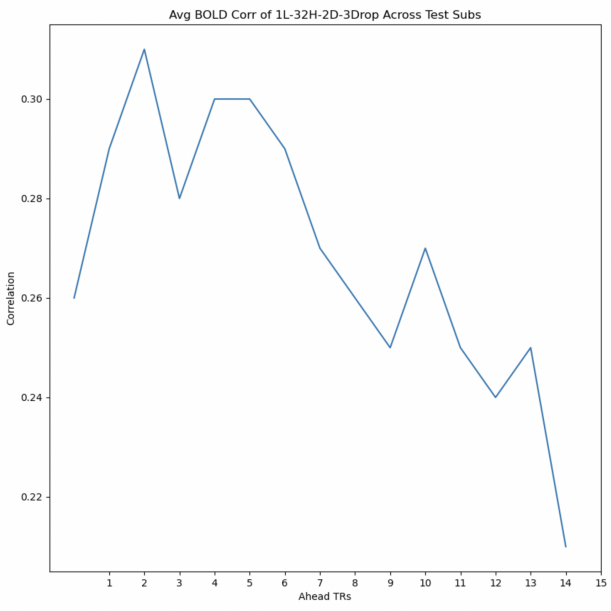




YOUNG OLD

- **lOFC**





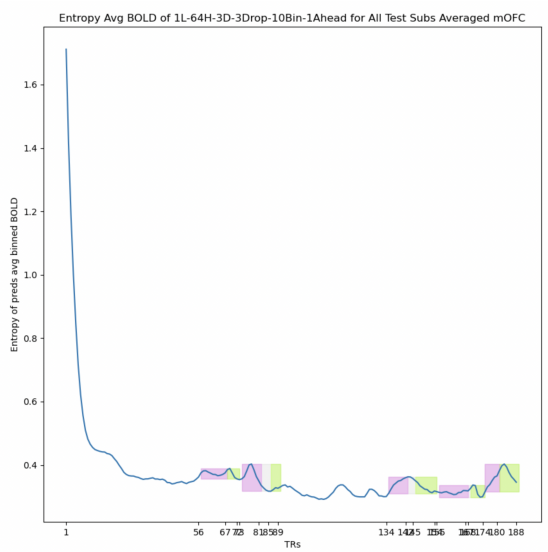
YOUNG OLD

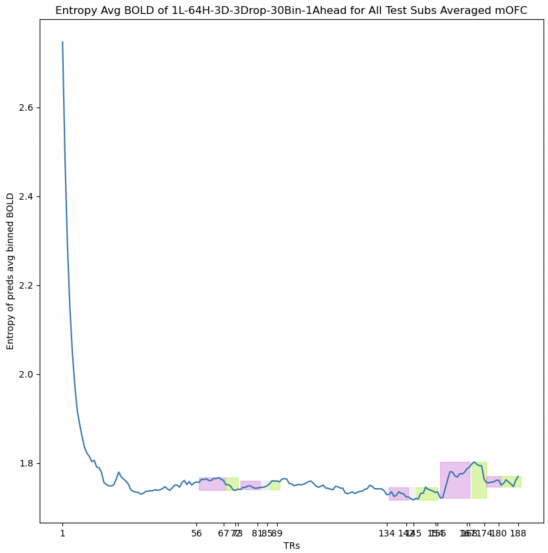
The correlation drops as the time ahead when predictions are made increases in both young and old subjects.
But common observations from the plots for old subjects are more erratic compared to young subjects.

6. Devise or track other measures for model selection as well as quantify uncertainty based on metrics for similarity and distance between actual and predicted signals.

Trying to attack in this direction, I estimate the entropy throughout the movie from the 1 TR ahead prediction model. Below, I present the results.

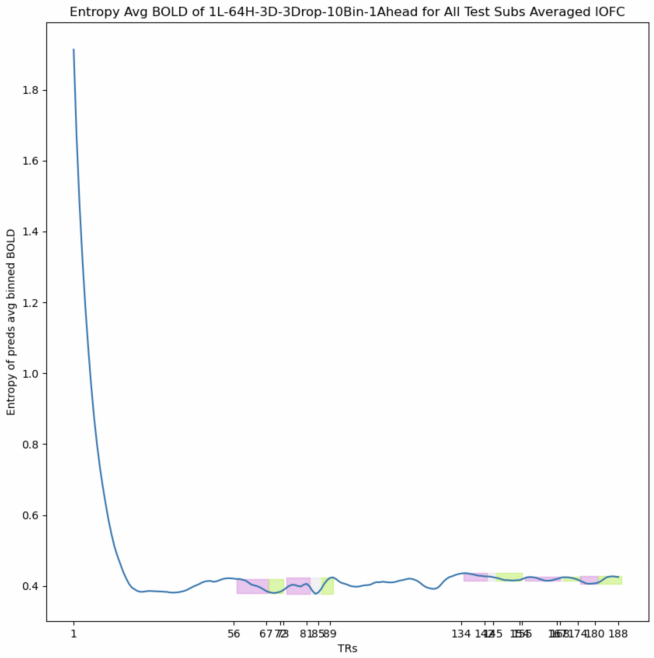
- **mOFC**

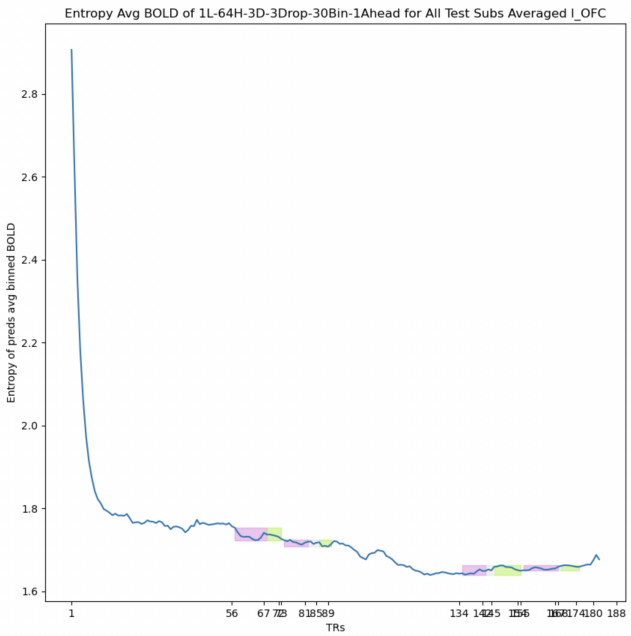




YOUNG OLD

- **IOFC**





YOUNG OLD

The entropy values on the Y-axis for young subjects are lesser than for old subjects. But the entropy values for older subjects are more jittery compared to the young subjects.