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认知的神经机制研究组

The laboratory of neuronal mechanisms of cognition

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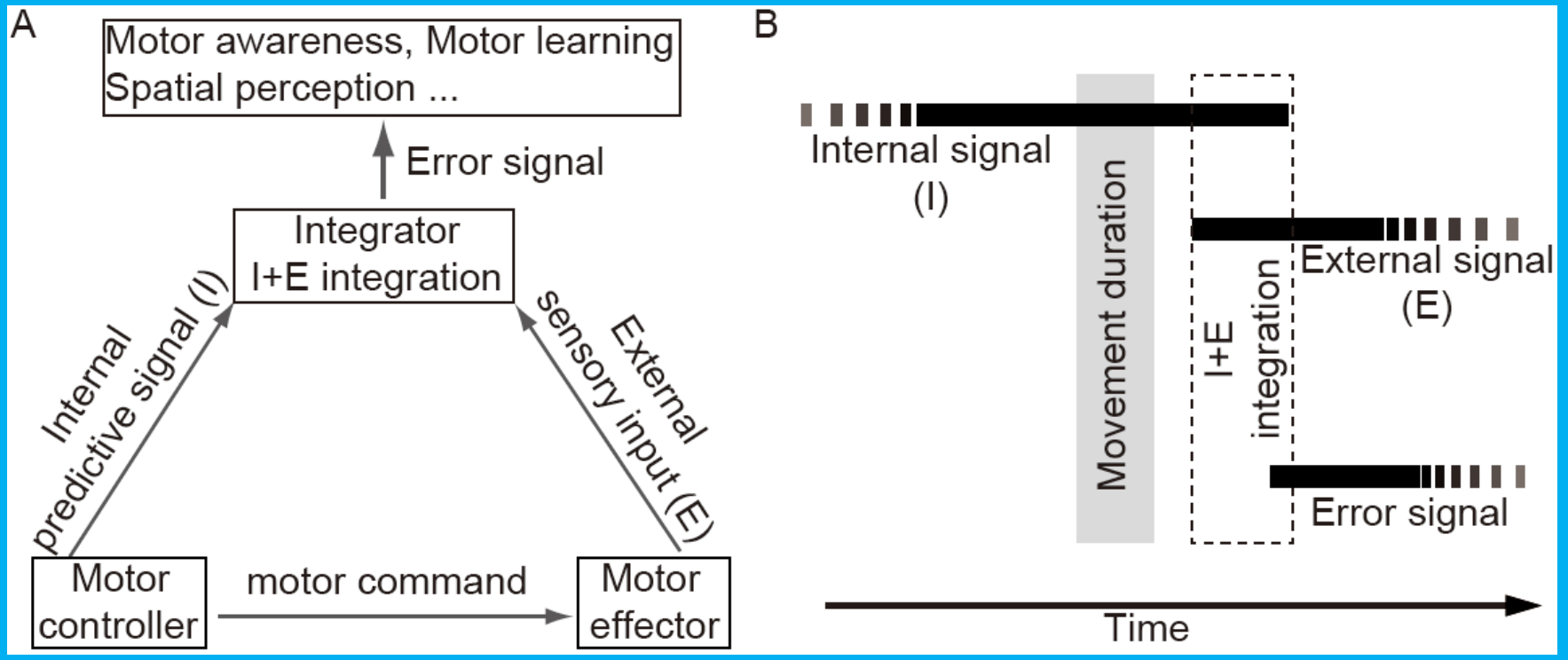
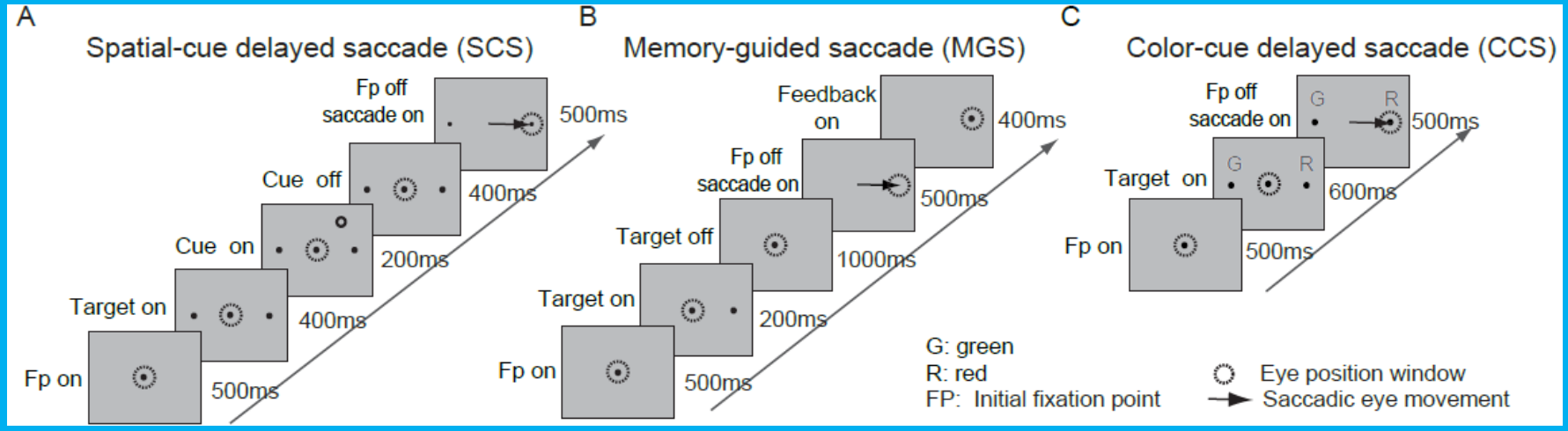
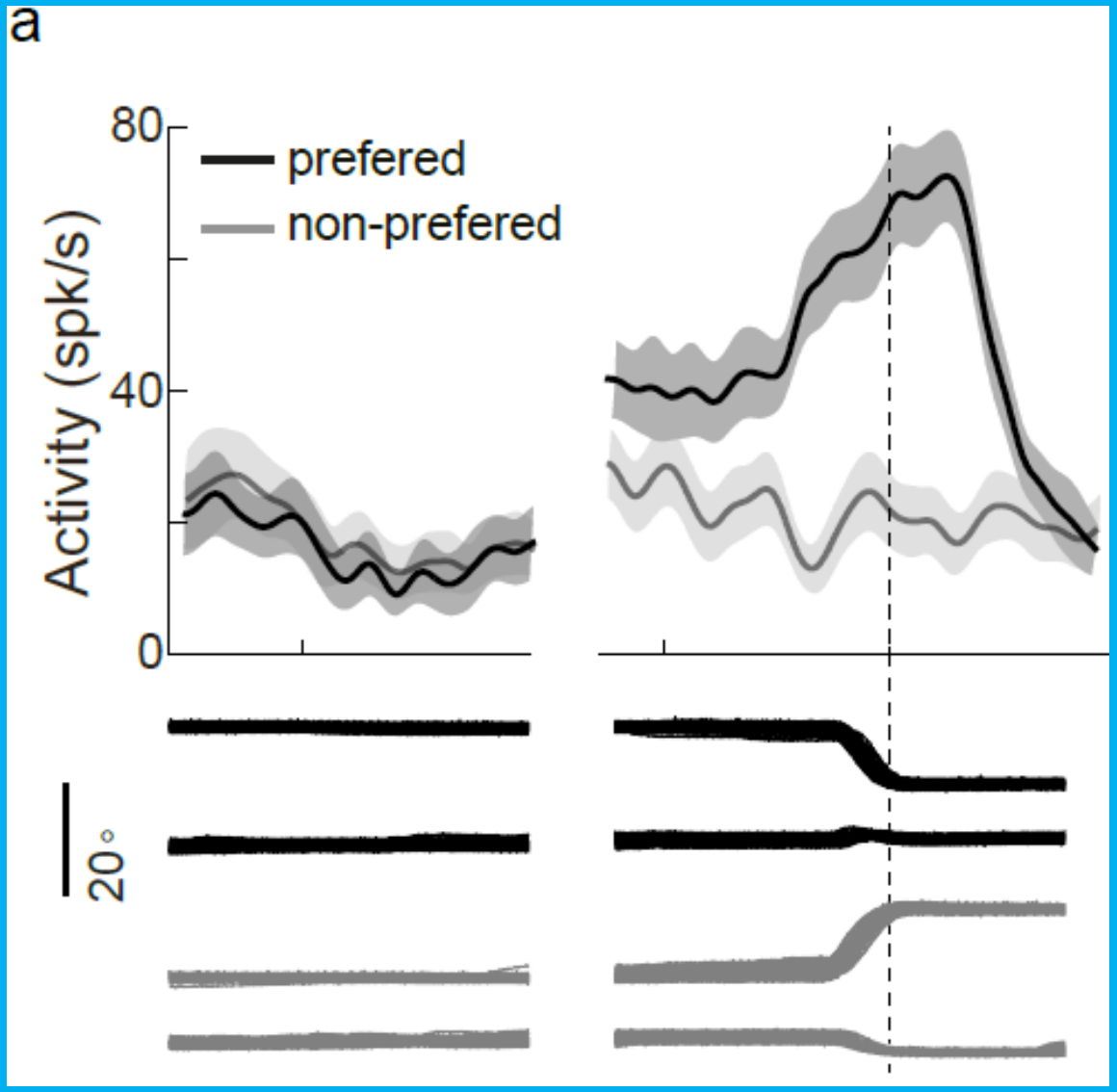
Integration of internal and external motor-related signals is crucial for motor control, motor learning, self-recognition and spatial perception



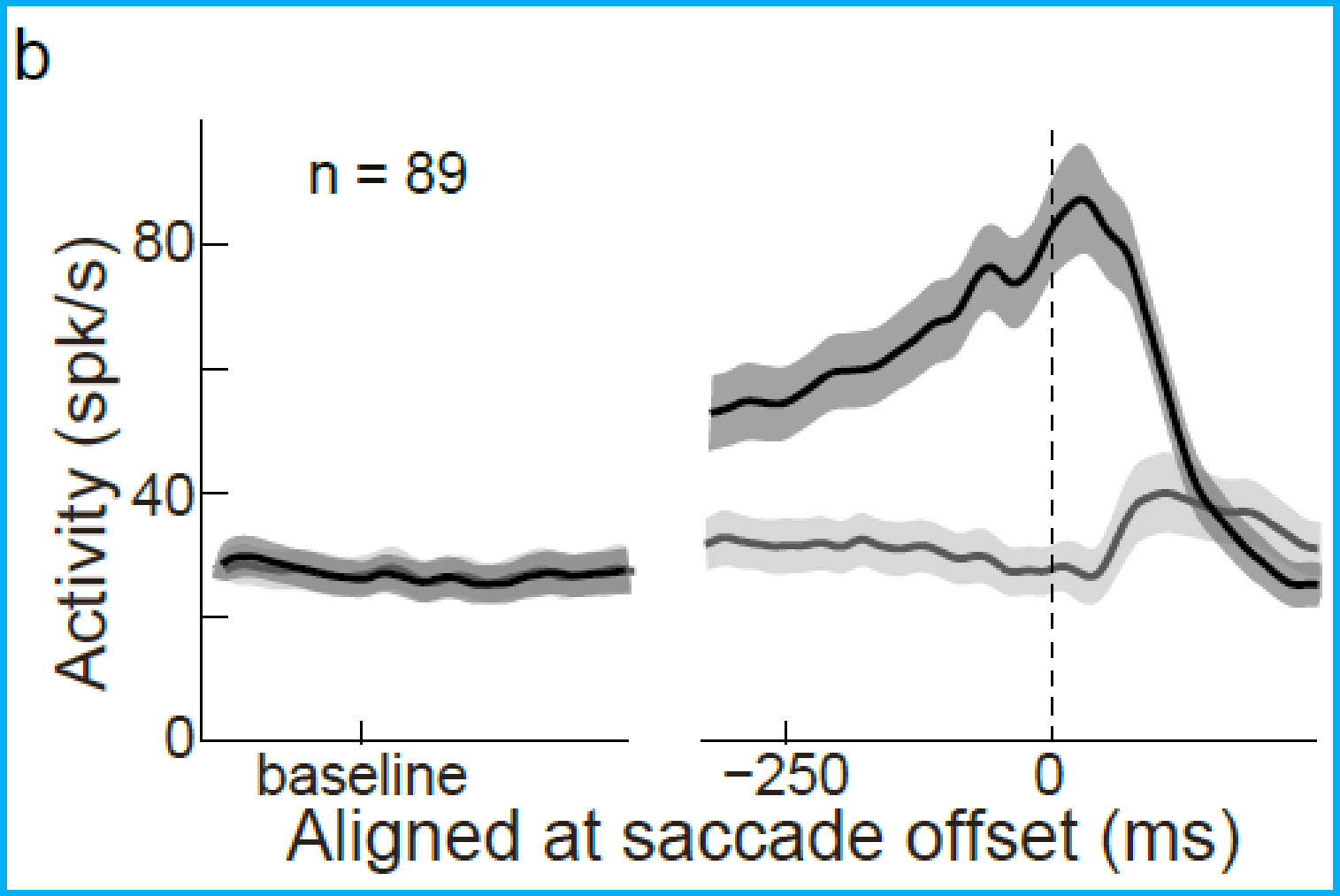
Behavior tasks



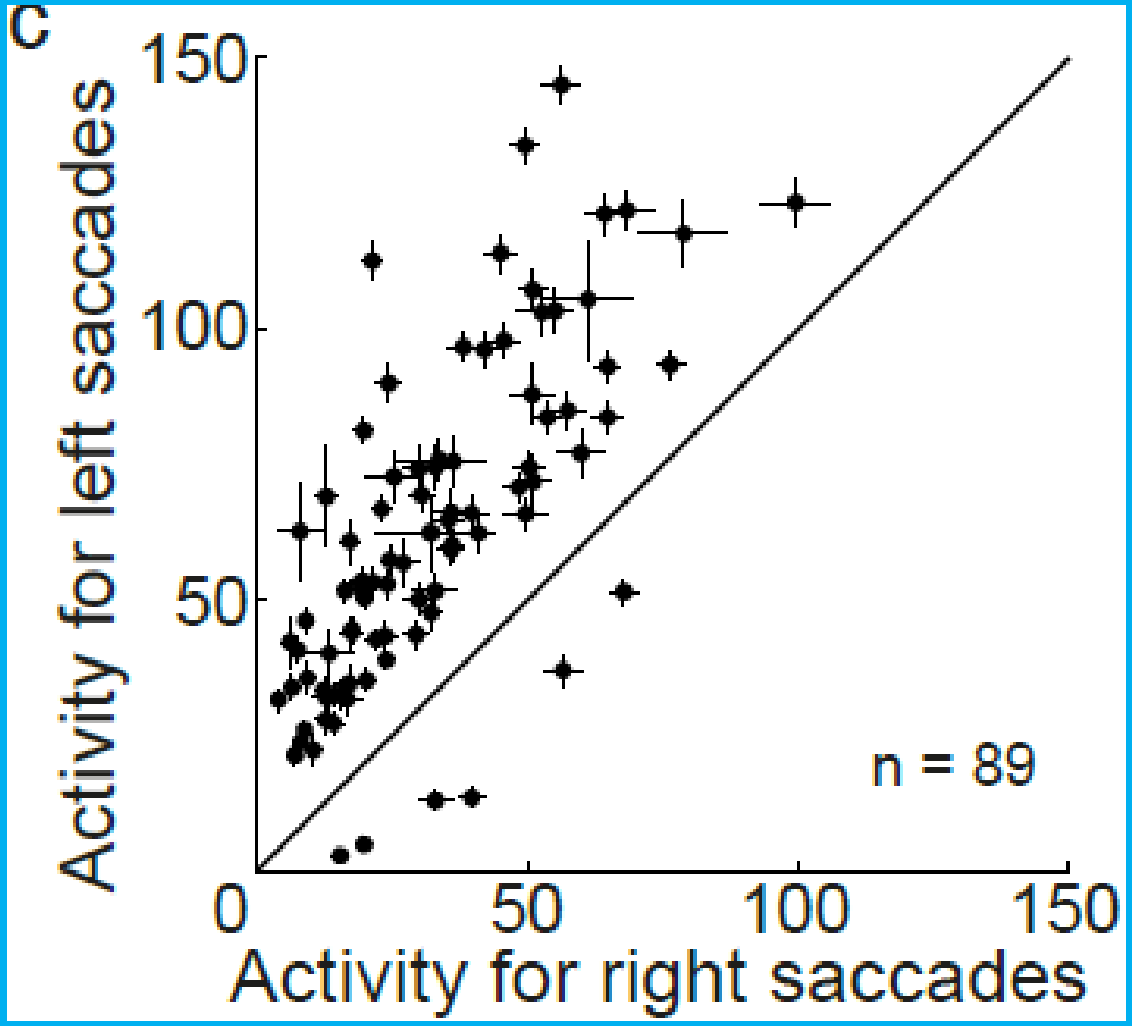
A pre- and postsaccadic response neuron



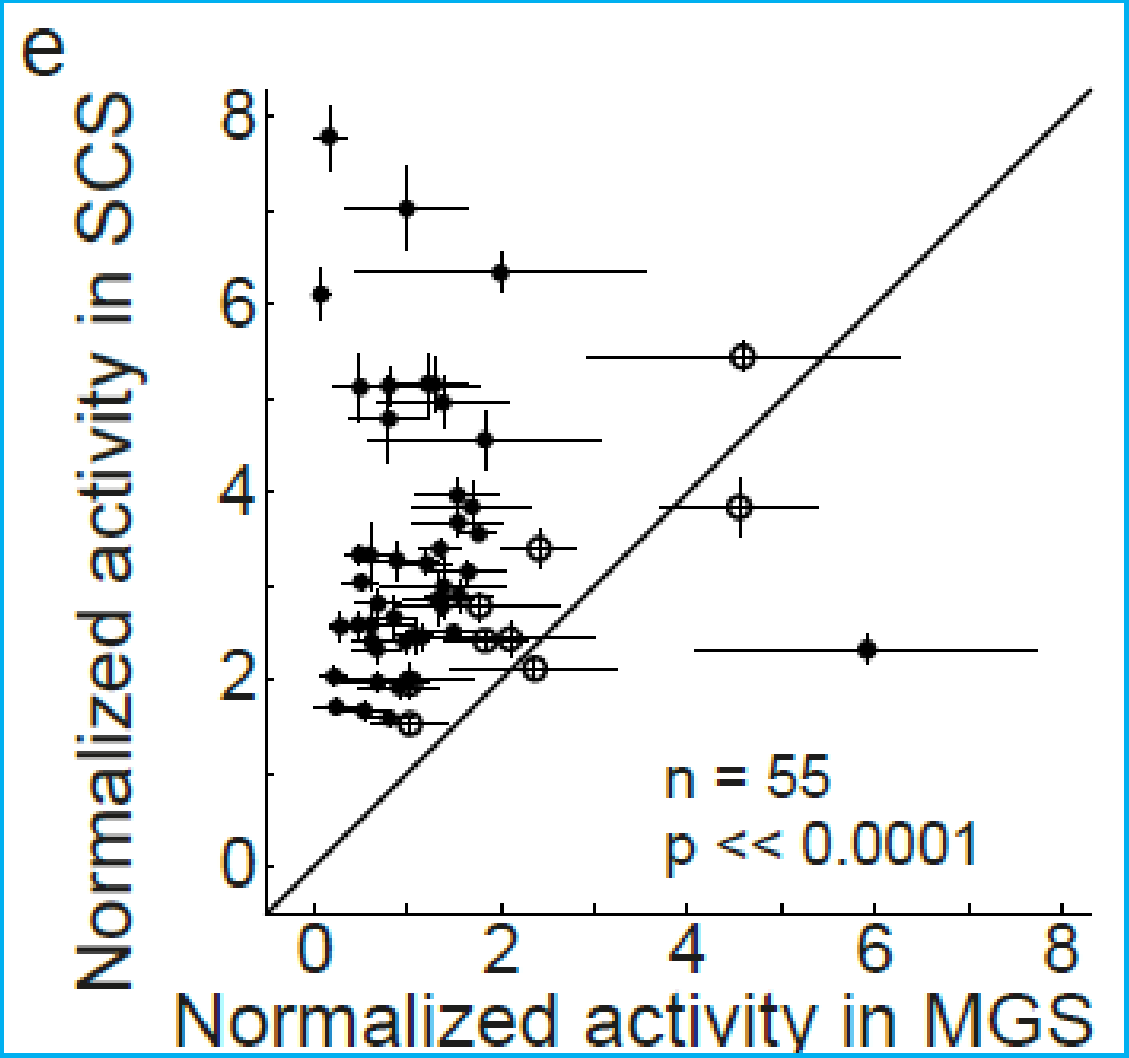
The population activity of pre- and postsaccadic response neurons



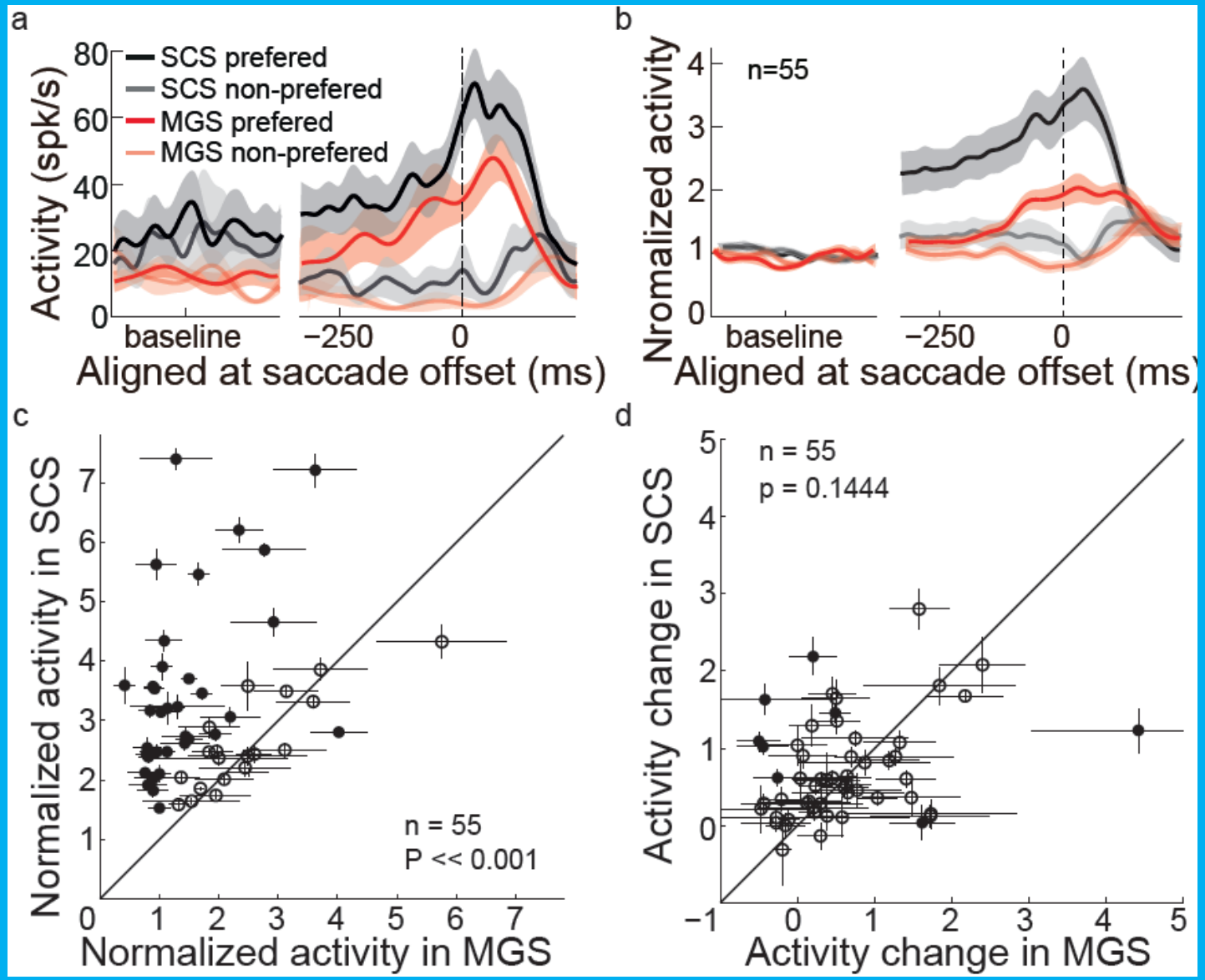
Perisaccadic activity is correlated with saccadic direction



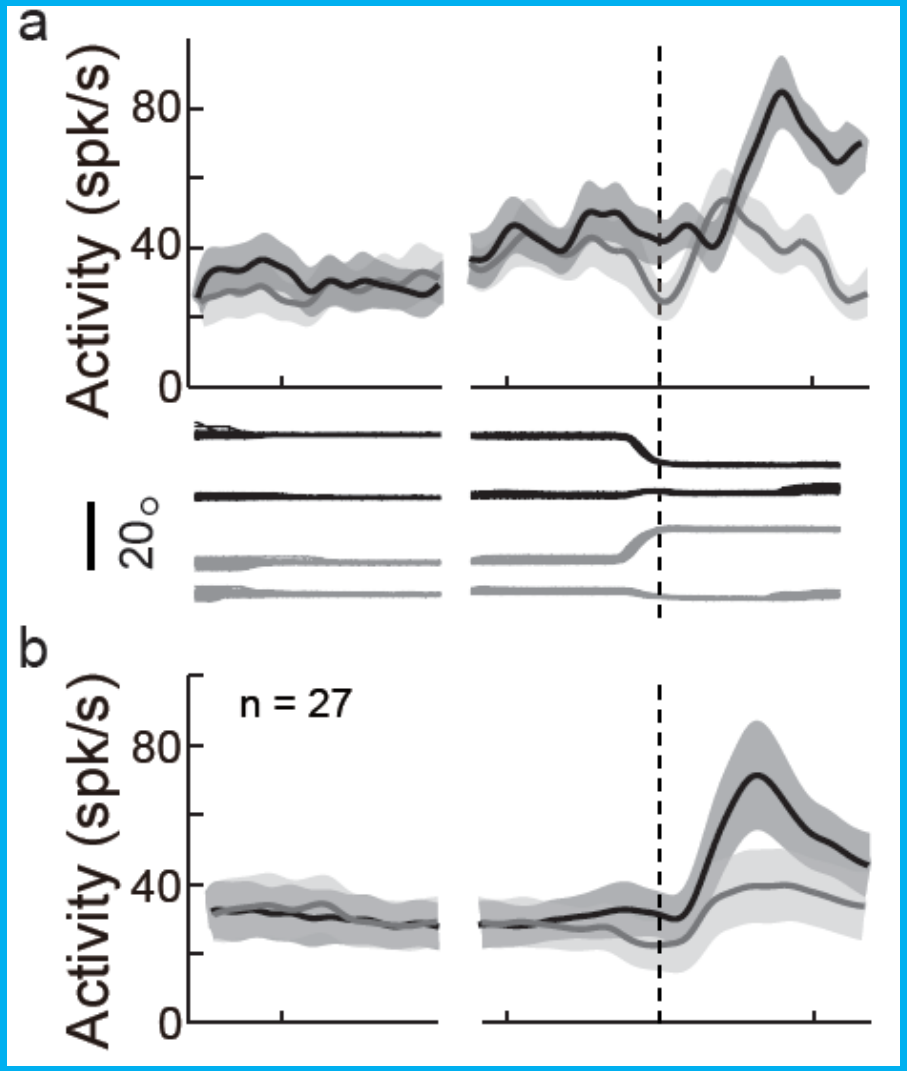
The postsaccadic activity is not fovea visual response



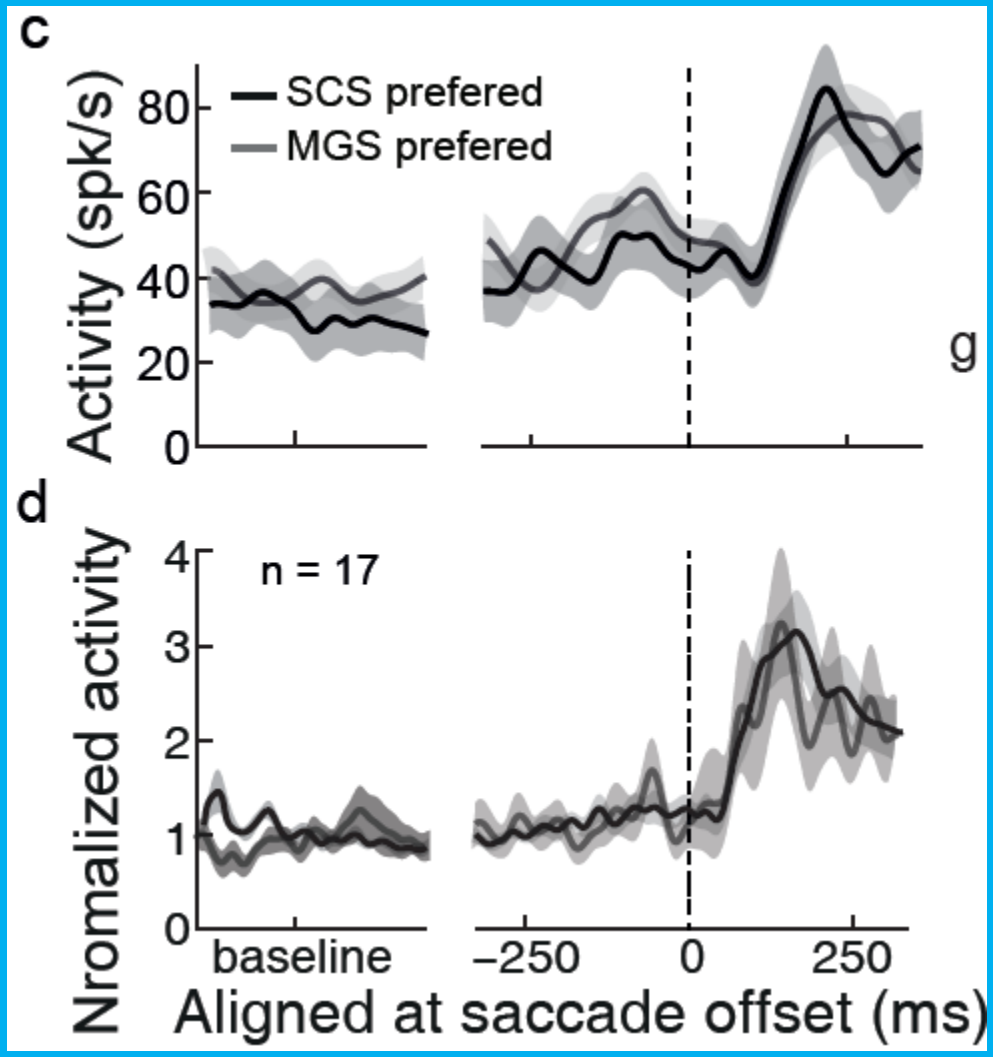
Similar response pattern between two tasks



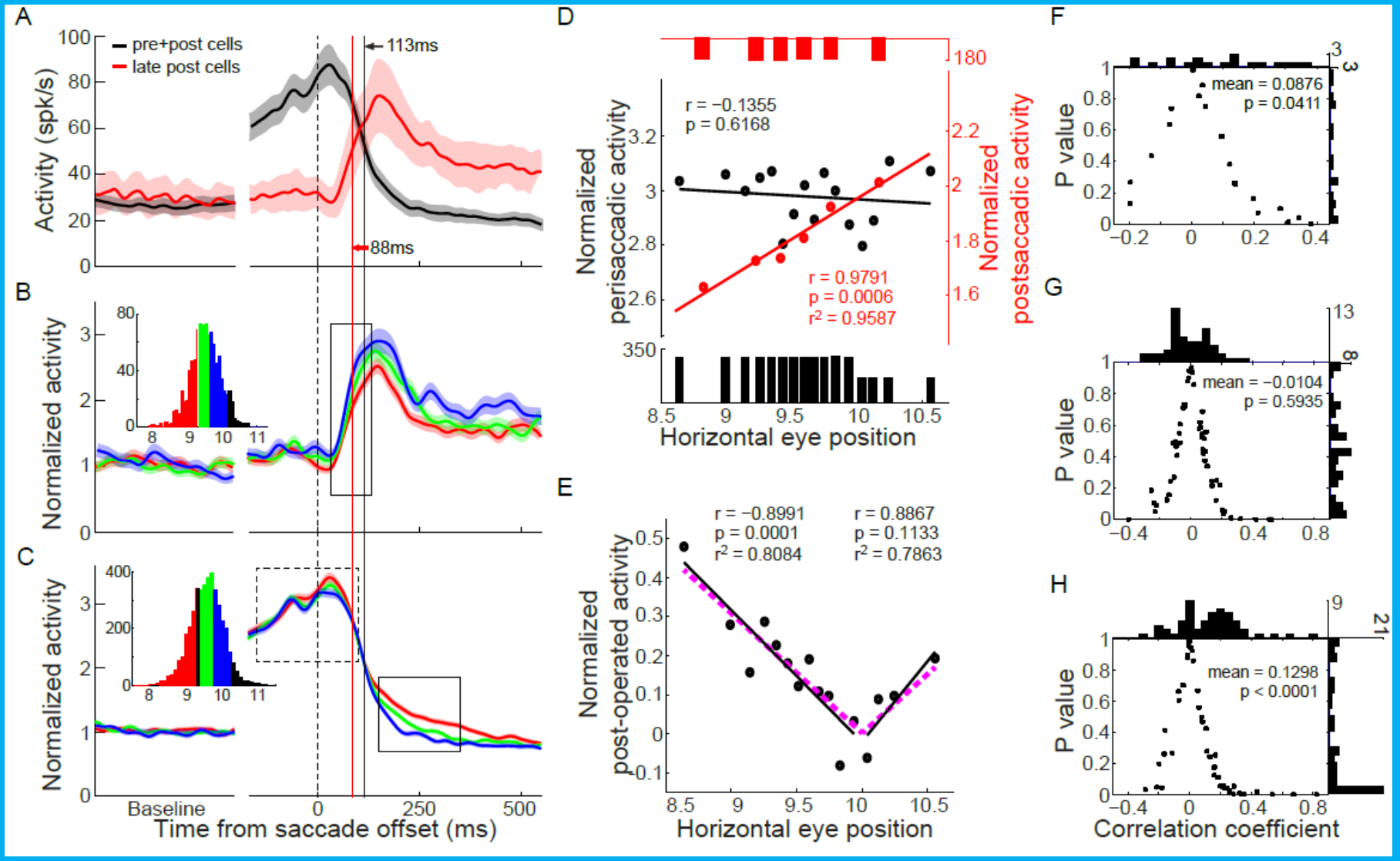
Late postsaccadic response neurons



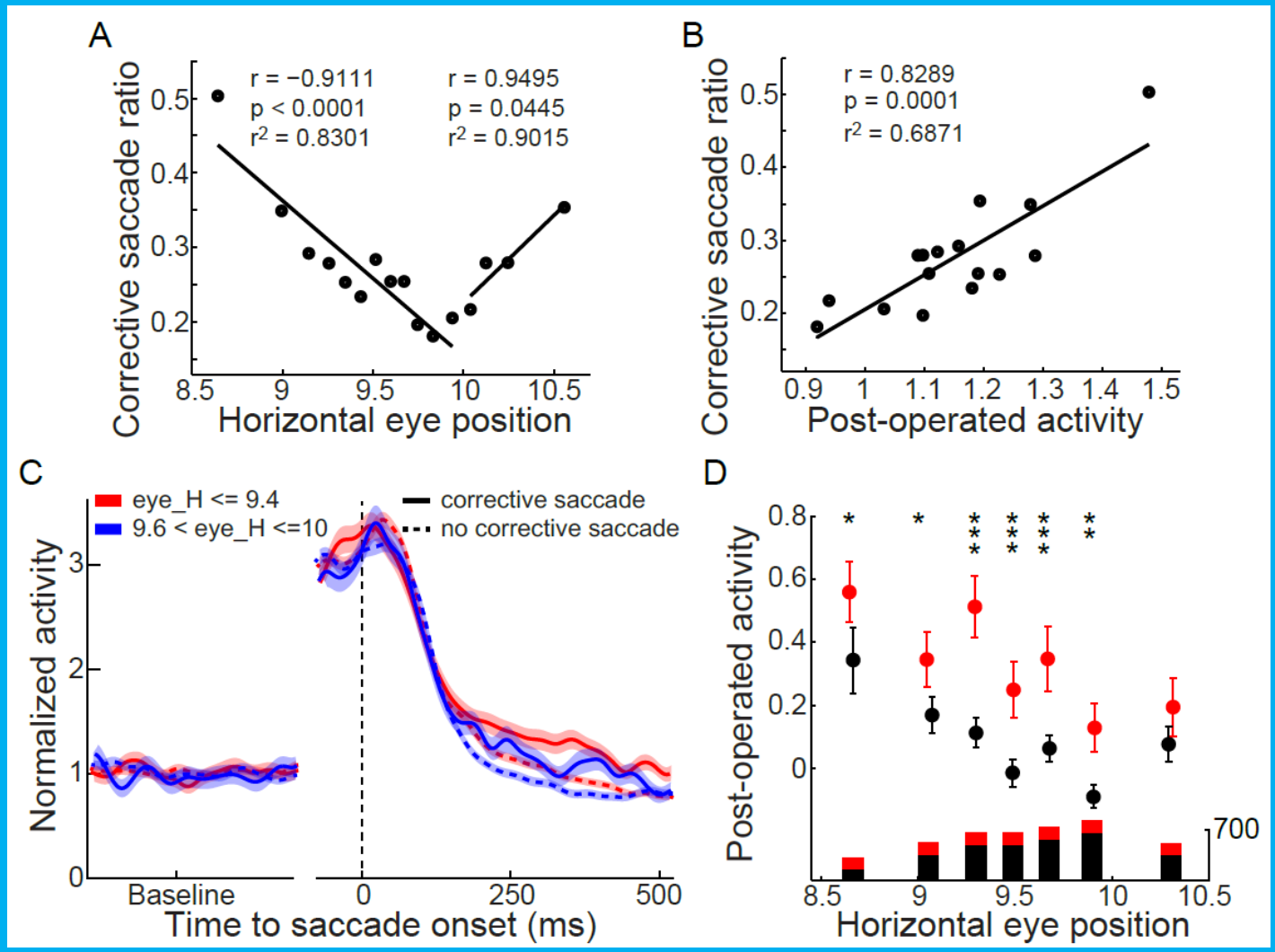
Late postsaccadic response neurons discharge similar between two tasks



Pre- and postsaccadic neurons activate as subtract operator to integrate the internal and external motor-related signals



Correlation of post-subtract activity with the probability of making corrective saccades



Conclusion

- **The predictive eye position signal—encoded by neurons with pre- and postsaccadic response, and the real position signal—encoded by neurons with late postsaccadic response, co-exist in macaque LIP.**
- **The pre- and postsaccadic response neurons behave like subtract operator: their activity starts to rise before the saccade initiation and lasts until the arrival of the external position signal, and the level of post-subtracted activity reflects the degree of congruence between internal and external signals.**
- **The level of post-integrated activity is highly correlated with the behavioral performance: the higher the post-integrated activity, the larger the saccadic error (distance between saccade end points and the saccadic target), and the higher the probability of making corrective saccade.**