# Is EEG better left alone for decoding?

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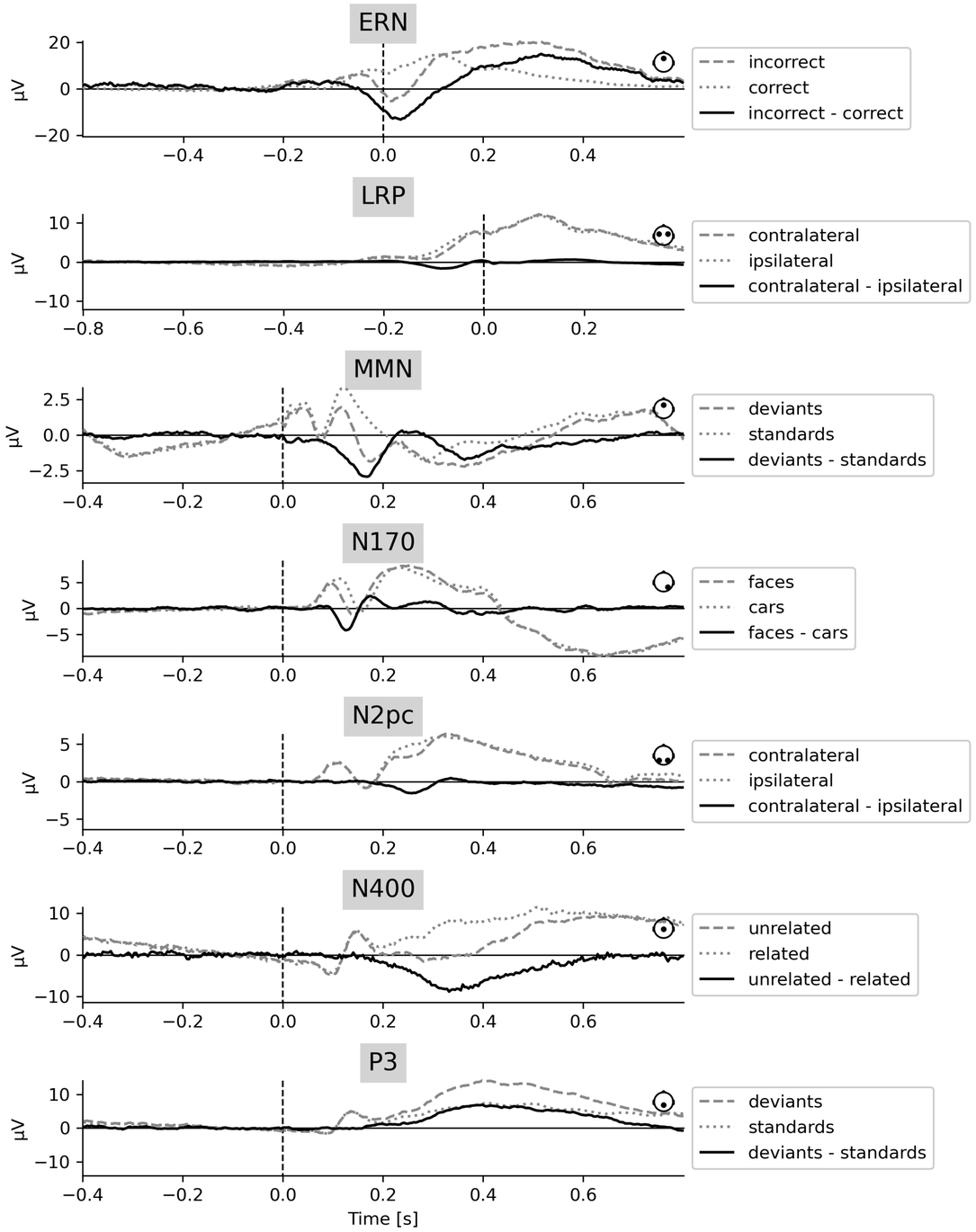
FOR HUMAN COGNITIVE AND BRAIN SCIENCES

# We analysed 7 experiments

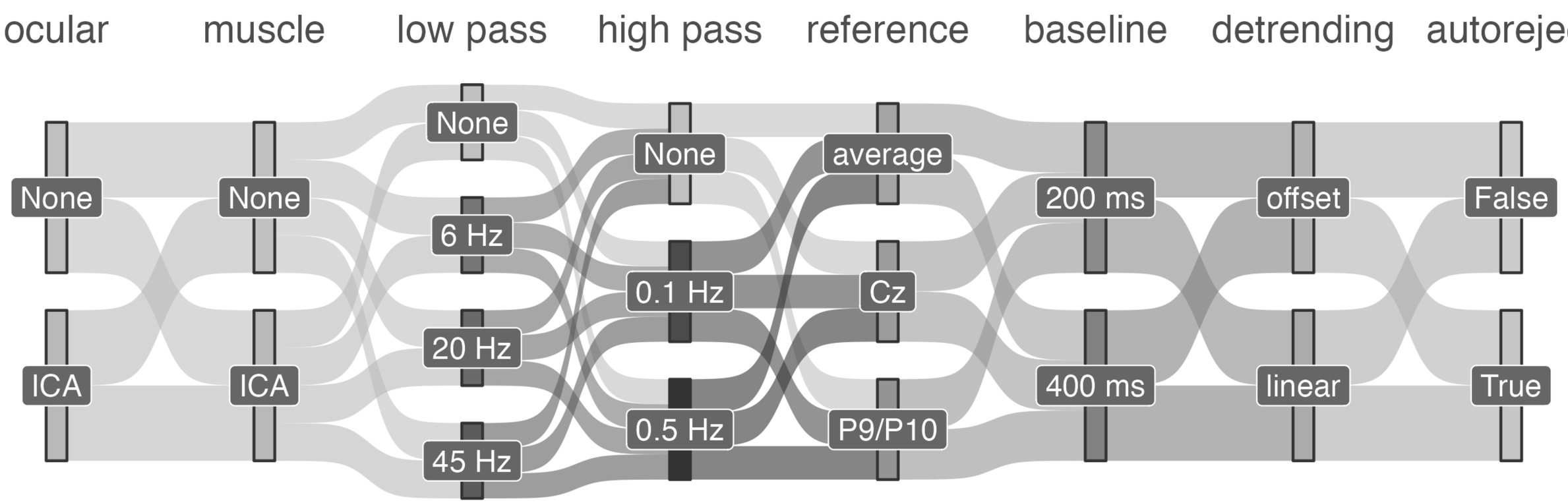
ERP CORE: An open resource for human event-related potential research

Emily S. Kappenman [a b], Jaclyn L. Farrens [a], Wendy Zhang [a b], Andrew X. Stewart [c], Steven J. Luck [c]

https://erpinfo.org/erp-core

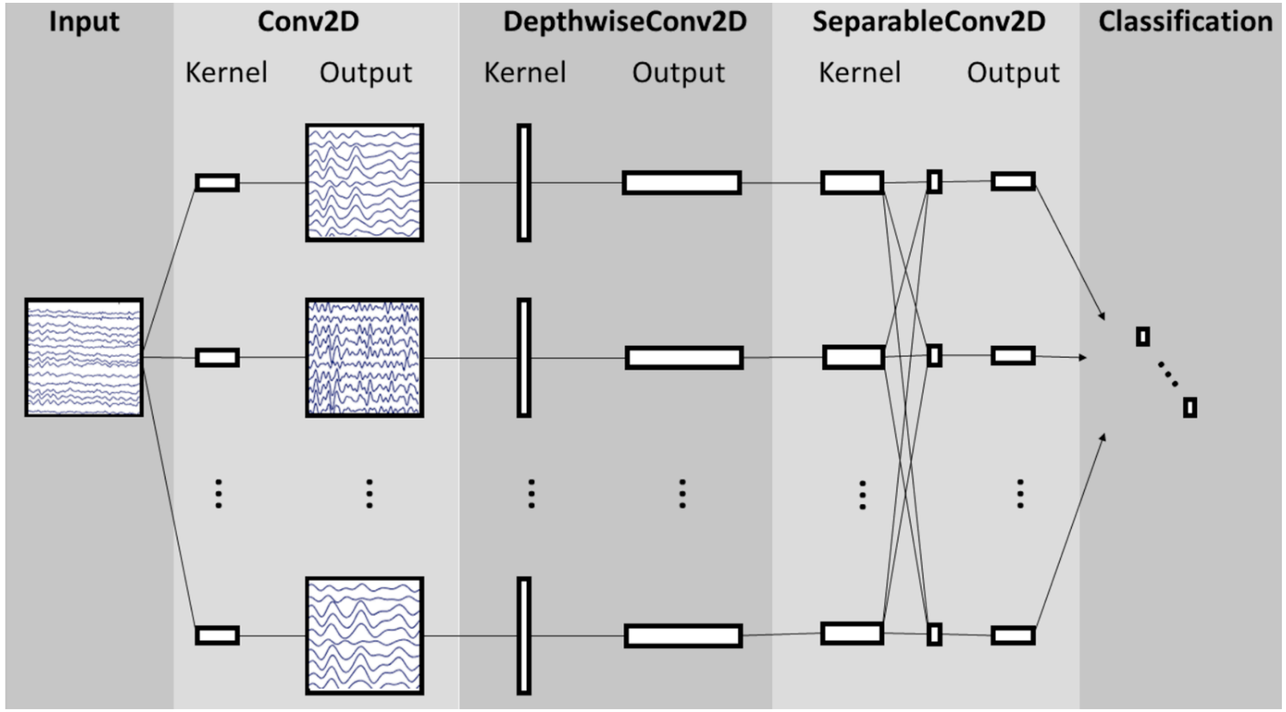


# A multiverse for preprocessing



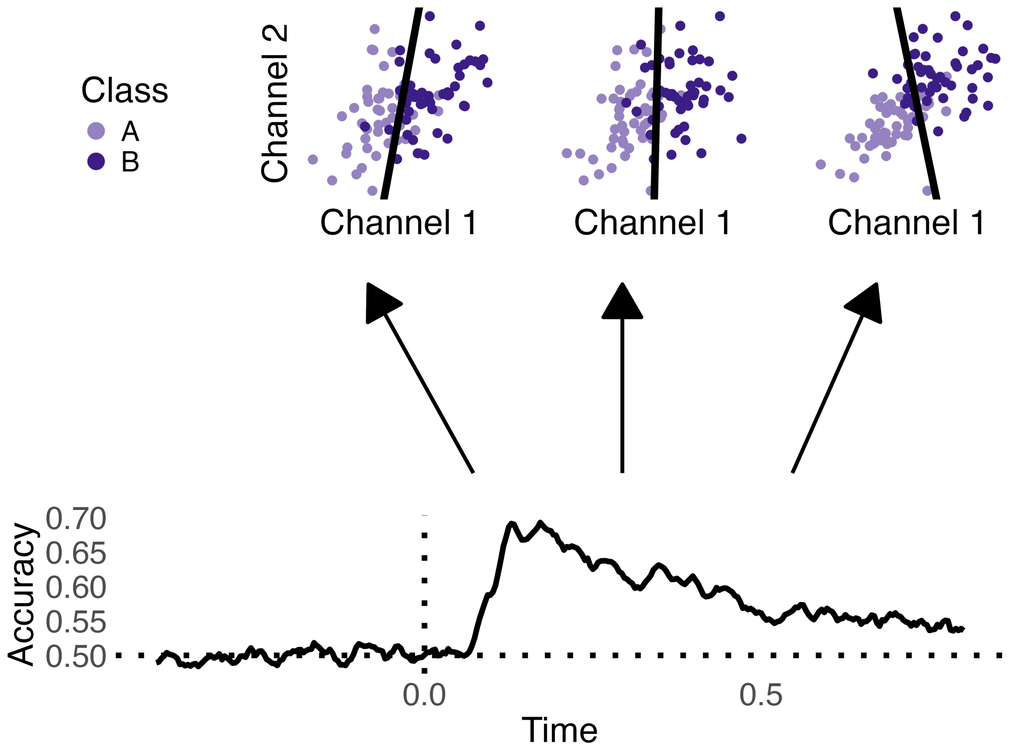
# Decoding

## EEGNet (Convolutional Neural Network-based)

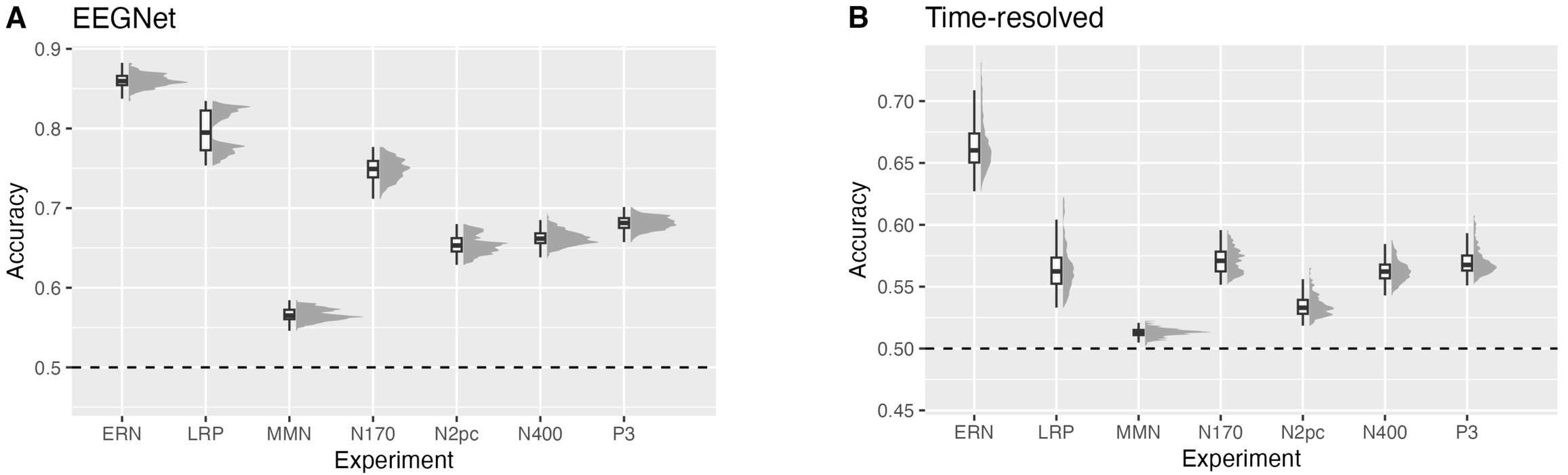



Lawhern et. al 2018 J.NeuralEng

## Time-resolved (Logistic Regression)



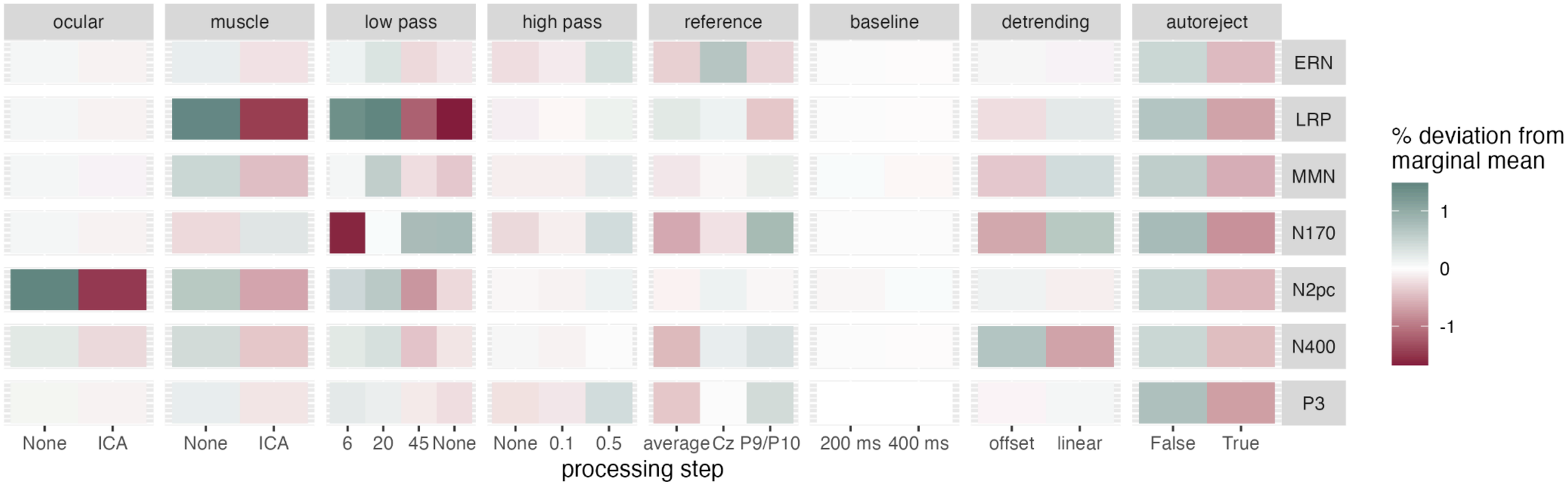
# Decoding accuracies




$$\text{accuracy} \sim 1 + \text{step}_1 + \text{step}_2 + \text{step}_1 * \text{step}_2 + \ldots + (1 + \text{step}_1 + \text{step}_2 + \text{step}_1 * \text{step}_2 + \ldots | \text{participant})$$

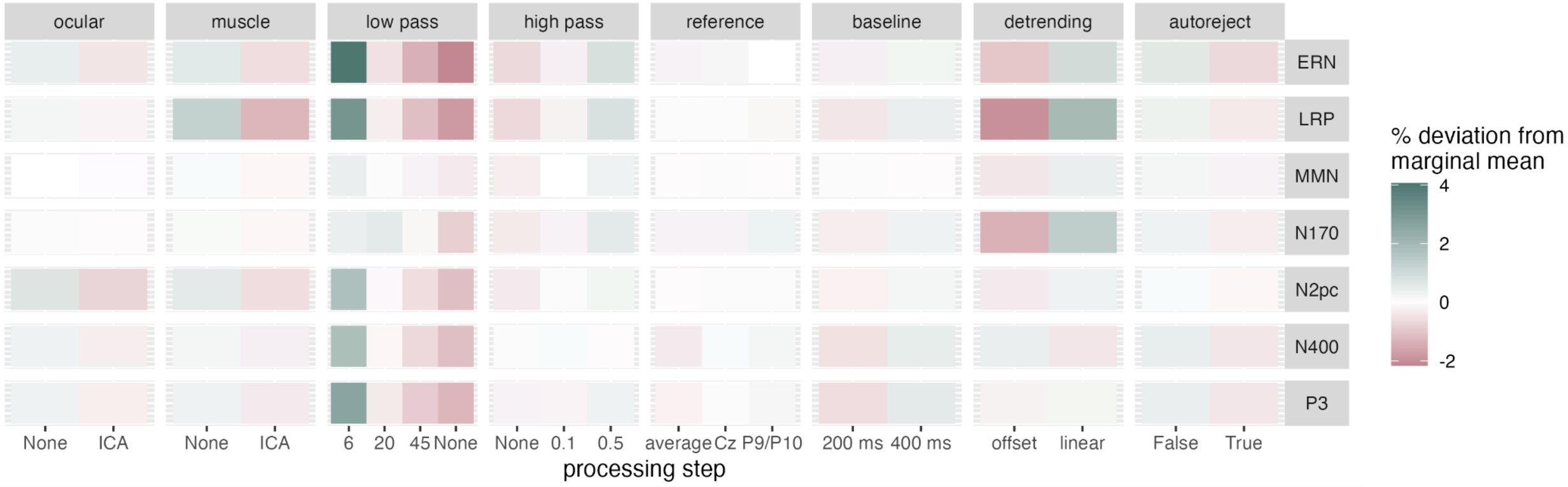
# Which steps enhance decoding accuracy?

## main effects - EEGNet



# Which steps enhance decoding accuracy?

## main effects - Time-resolved decoding



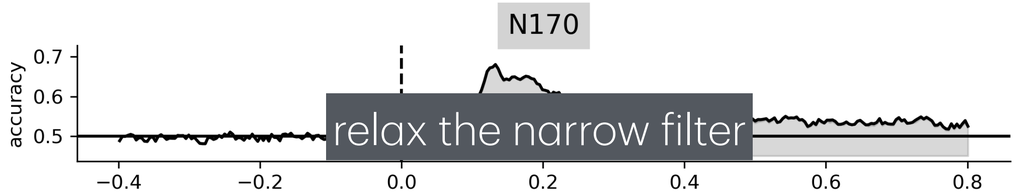
# Is EEG better left alone for decoding?

## It depends.

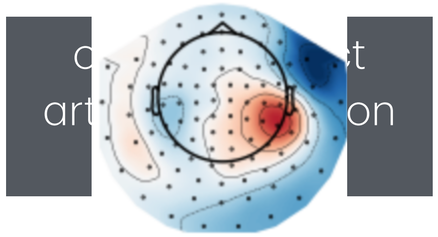
Maximise decoding performance ?

narrow filter,
no artifact correction

Interpret timing ?




Interpret spatial feature importance ?




Comments & questions:
write me!
rkesslerx@gmail.com

Visit my poster: Friday 16:30-18:00

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