Neural Correlates of Value Are Intrinsically History Dependent.

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The authors have withdrawn their manuscript since they no longer stand by the results reported in this preprint. Therefore, the authors do not wish this work to be cited as reference for the project. If you have any questions, please contact the corresponding author.

Main Text:

We previously reported that brain regions where neural activity was positively correlated with the subjective value (SV) estimates of the offer on the current trial also showed activity that was negatively correlated with the SV estimates on past trials (Fig. 1A). This finding was robust across multiple brain regions and was replicated across two different decision-making tasks. However, after changing our analysis pipeline from FSL to fmriprep, we found that we were unable to replicate the negative correlations with past SV estimates (Fig. 1B).

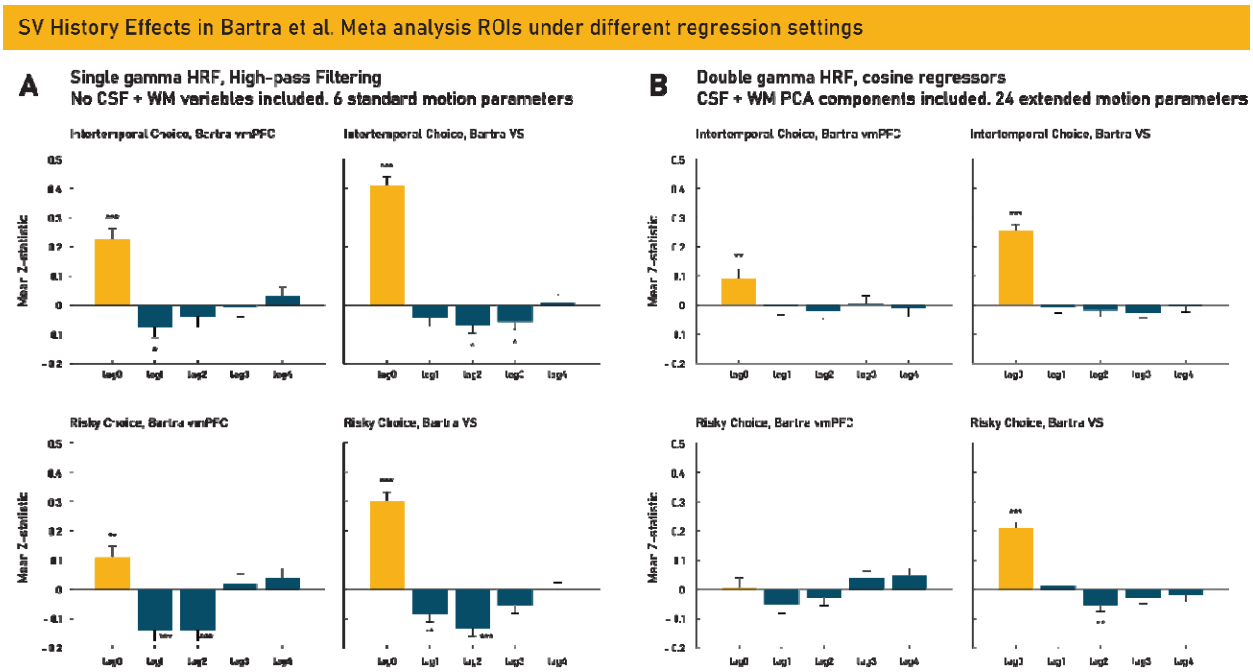

*Figure 1. Analysis of SV history effects using previous GLM settings (A) versus new GLM settings (B). * p < .05, p < .01, p< .001 uncorrected.*

We could not trace the source of this discrepancy to any single difference between the two GLM settings. There were 5 main differences between our previous analytical approach based entirely in FSL and our new approach based on the derivatives from fmriprep: 1) modeling the hemodynamic response function with a single-gamma versus double-gamma function, 2) removing low-frequency noise with a high-pass filter versus cosine regressors, 3) whether CSF and white matter average activities are included as nuisance regressors, 4) whether PCA components of CSF and white matter activity are included as nuisance regressors, and 5) whether 6 or 24 motion parameters are included as nuisance regressors. After checking all possible combinations (32 settings), we found that all 5 differences contribute independently to reducing the negative SV history effects in neural activity.

While there is no consensus on which regression approach is “best” for fMRI data, the fact that negative SV history effects are not robust to these different effects reduces our confidence in their existence.