

617 **Supplemental Information**

618 **Suppl. Figure 1. STN activity is modulated by choice and RT.** Same format as Figure 2,
619 except using choice and RT as regressors.

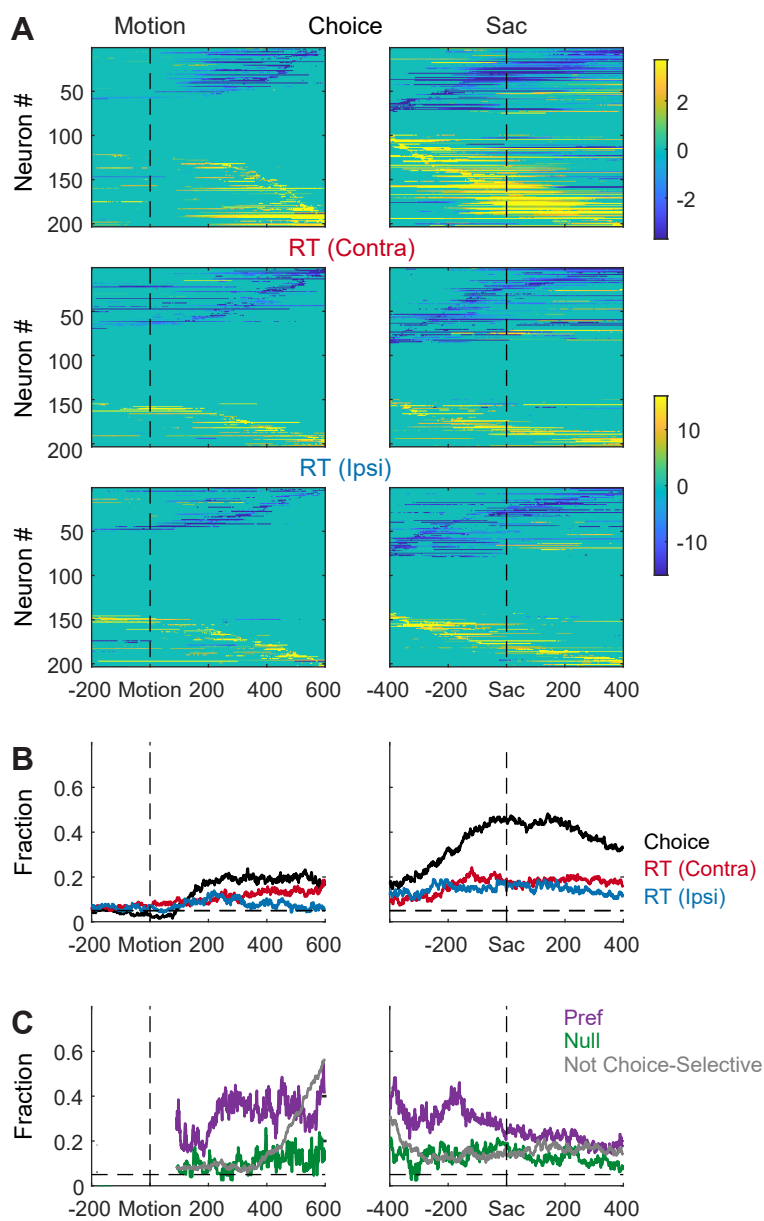
620 **Suppl. Figure 2. Clustering parameters.** A, Silhouette plots for clustering results using
621 different combinations of settings. Silhouette scores for neurons are grouped by clusters and
622 sorted. Red lines indicate the mean scores. Yellow shaded box indicates the chosen setting for
623 results in Figure 3. B, Average Rand indices for different clustering settings. For each setting, the
624 k-means algorithm was run 50 times, each time picking the best clusters out of 100 repetitions.
625 Higher Rand index indicates greater cluster stability across different runs. C, Mean silhouette
626 scores and the number of negative scores as a function of number of clusters, using the firing rate
627 vectors and correlation distance. Higher mean score and fewer negative scores indicate better
628 clustering.

629 **Suppl. Figure 3. Clustering results using alternative numbers of clusters, visualized in tSNE**
630 **space.** Same format as Figure 3E.

631 **Suppl Figure 4. Comparison of different logistic models.** A, The No Lapse model was
632 associated with the lowest AIC for most sessions. The Symmetric Lapse model was associated
633 with lower AICs for 12 sessions. The Asymmetric Lapse model was associated with lower AICs
634 for 8 sessions. B, Histograms of microstimulation effects on bias, slope, and lapse terms in the
635 Symmetric Lapse model. C, Histograms of microstimulation effects on bias, slope, and two lapse
636 (for each choice) terms in the Asymmetric Lapse model. Same format as the histograms in Figure
637 6A.

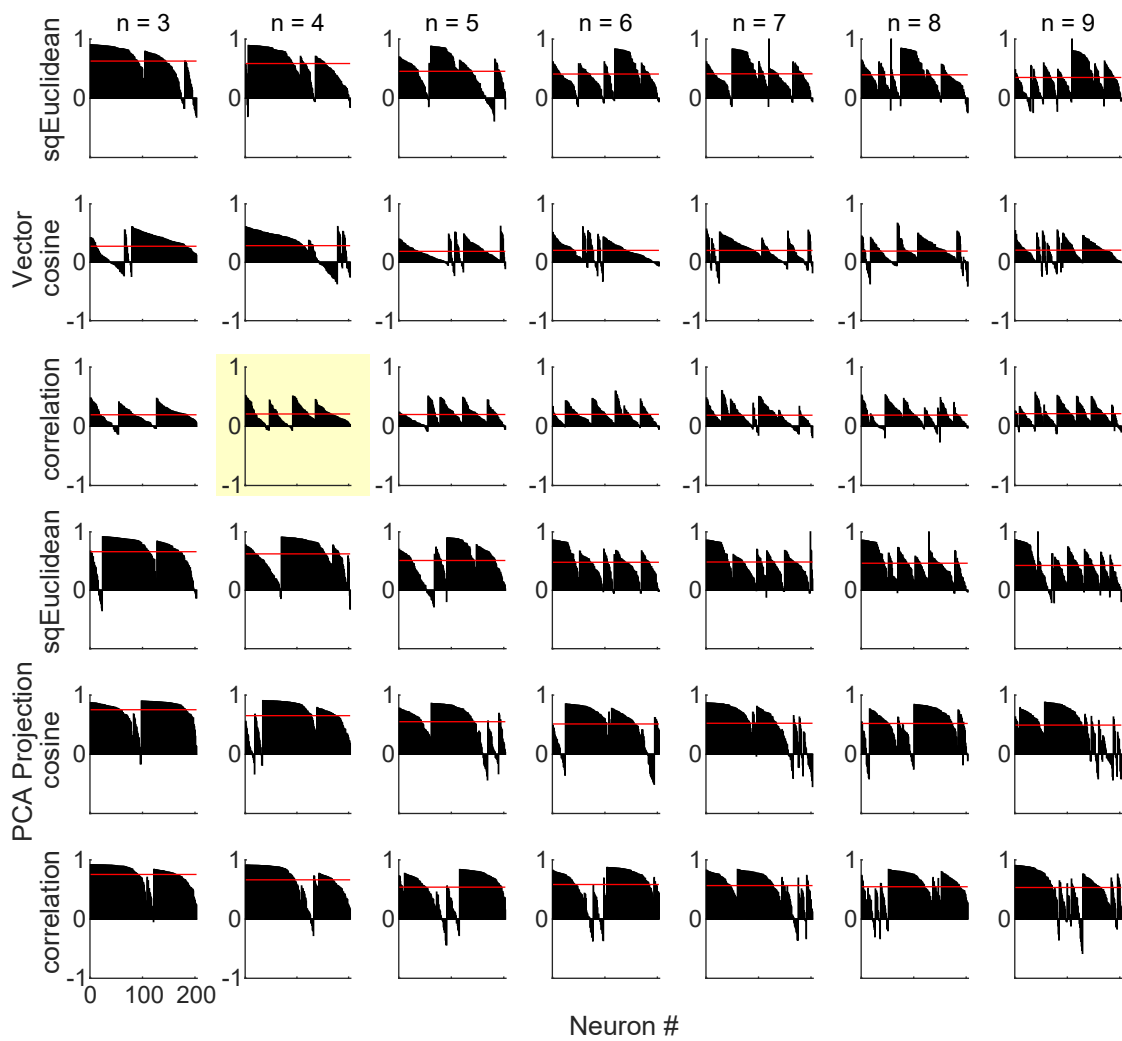
638 **Suppl Figure 5.** A, Differences in AIC between reduced and Full models. Filled circles indicate
639 sessions for which $AIC_{\text{Reduced}} - AIC_{\text{Full}} > 3$ (red line). Note that for three sessions, the Full model
640 outperformed the None model but not any of the reduced models. B, Histograms of difference in
641 DDM parameters between trials with and without microstimulation. Filled bars represent
642 sessions considered to show significant microstimulation effects on the given parameter, based
643 on AIC comparisons. Triangles indicate median values. Filled triangles: Wilcoxon sign-rank test,
644 $p < 0.05$.

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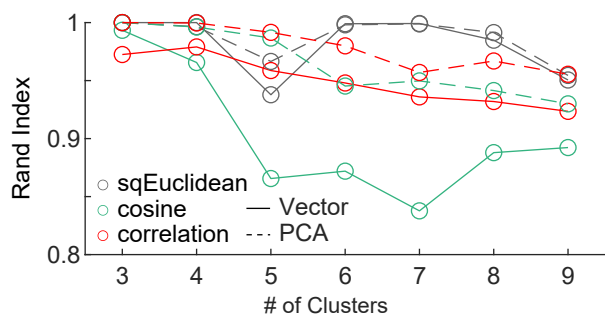


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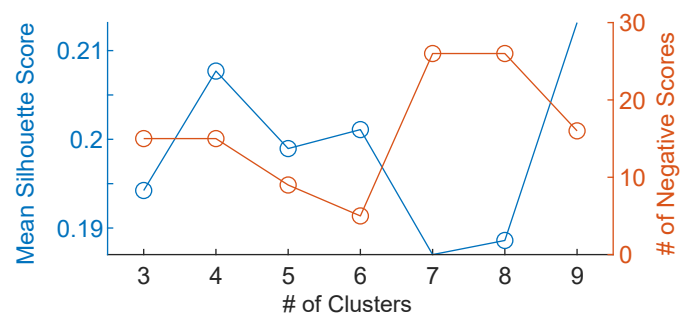
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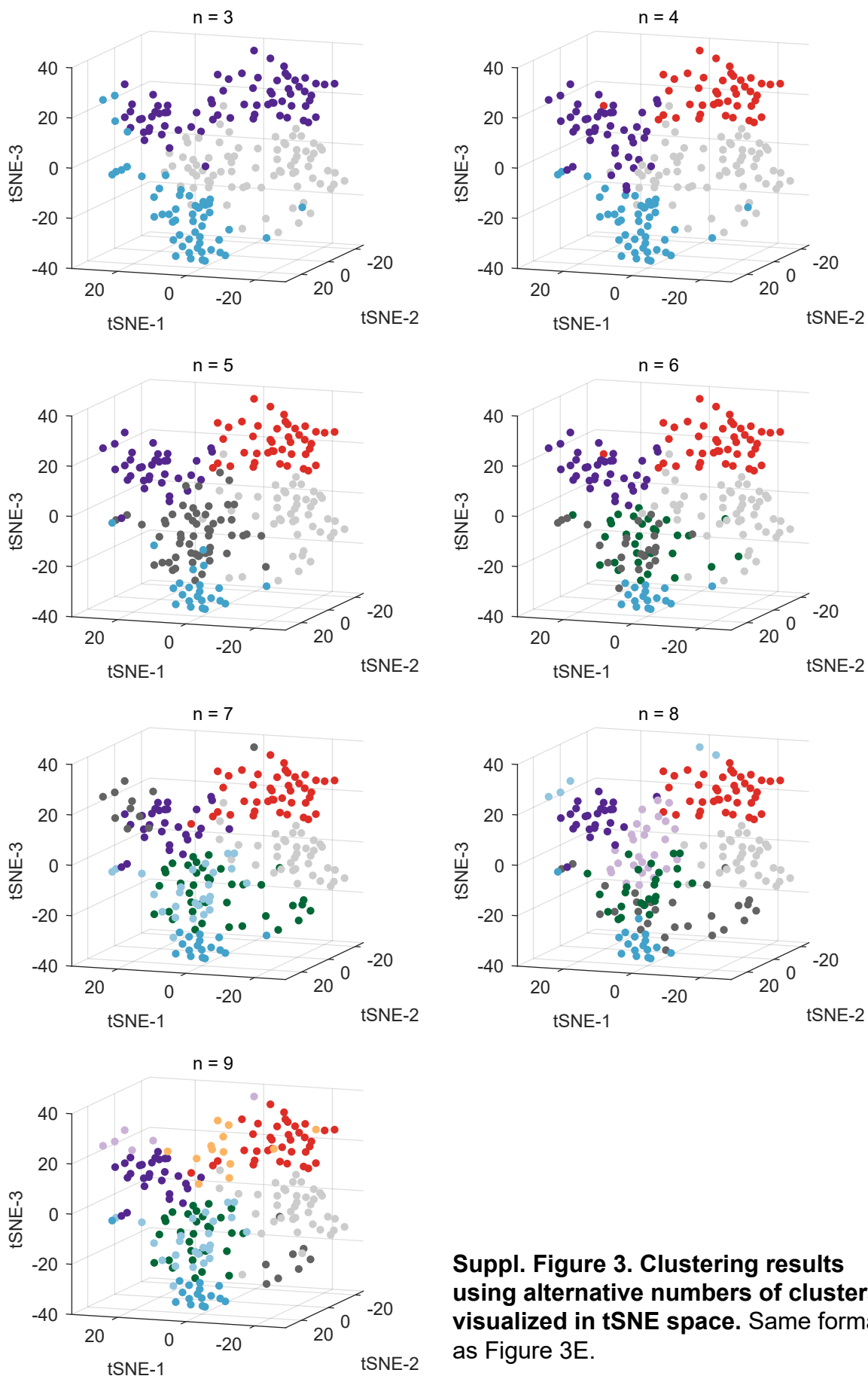
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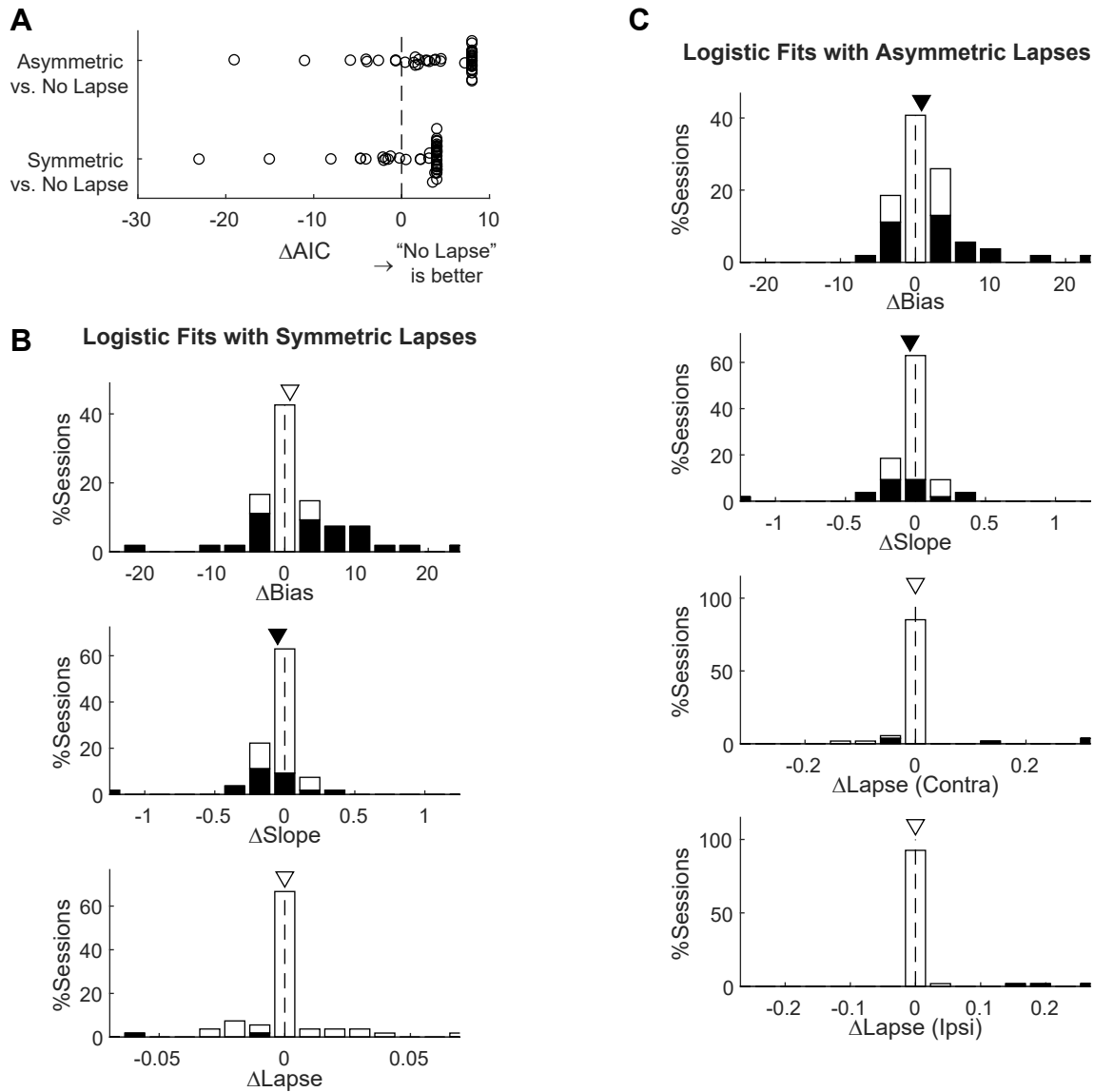
C



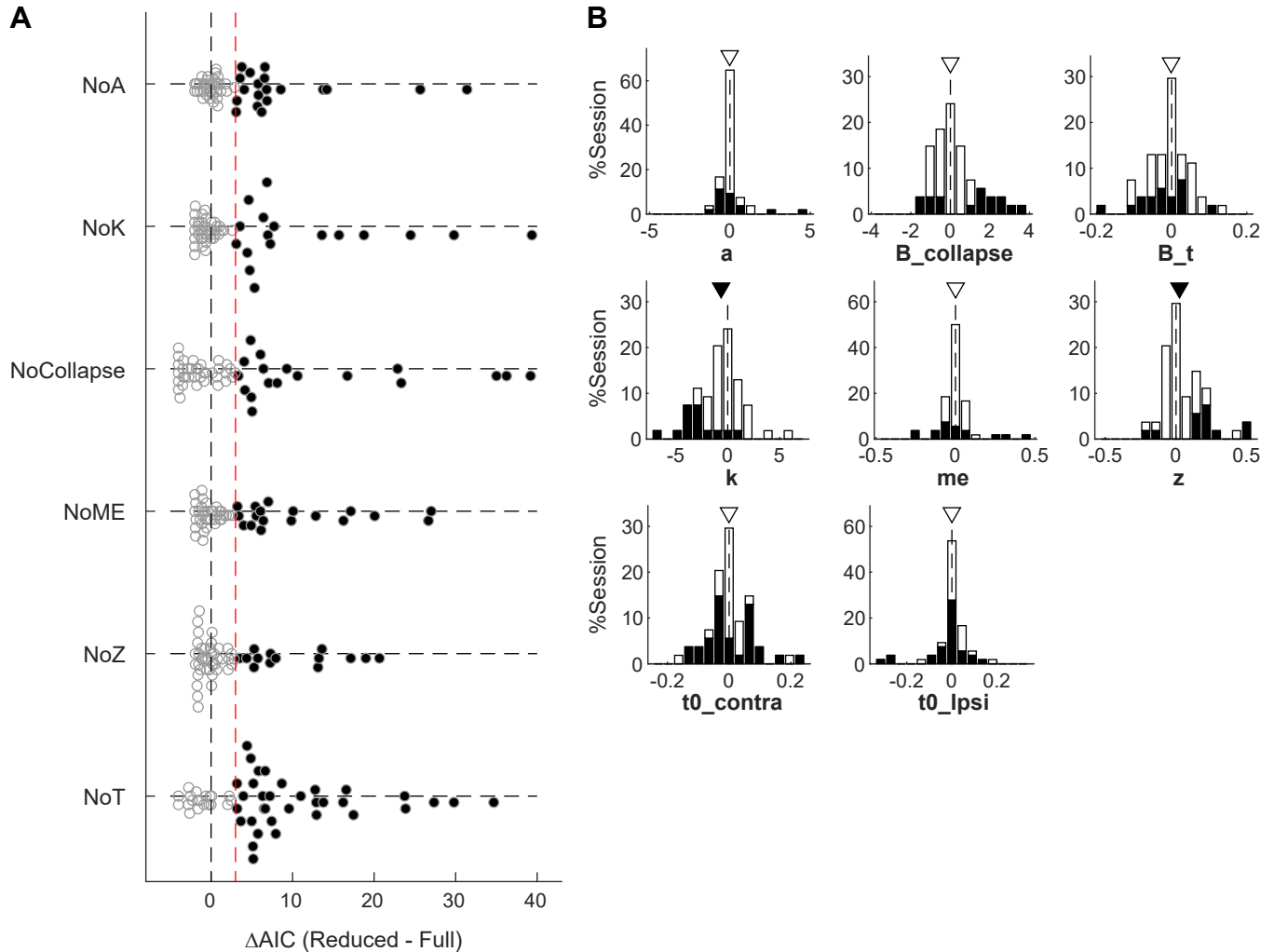
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Suppl Figure 5. A, Differences in AIC between reduced and Full models. Filled circles indicate sessions for which $AIC_{\text{Reduced}} - AIC_{\text{Full}} > 3$ (red line). Note that for three sessions, the Full model outperformed the None model but not any of the reduced models. B, Histograms of difference in DDM parameters between trials with and without microstimulation. Filled bars represent sessions considered to show significant microstimulation effects on the given parameter, based on AIC comparisons. Triangles indicate median values. Filled triangles: Wilcoxon sign-rank test, $p < 0.05$.