

Supplemental Material

Research Articles | Behavioral/Cognitive

Distinct neural modes carry information about attempted grasp timing and force in the sensorimotor cortex

<https://doi.org/10.1523/JNEUROSCI.0205-26.2026>

Received: 29 January 2026

Revised: 10 June 2026

Accepted: 18 July 2026

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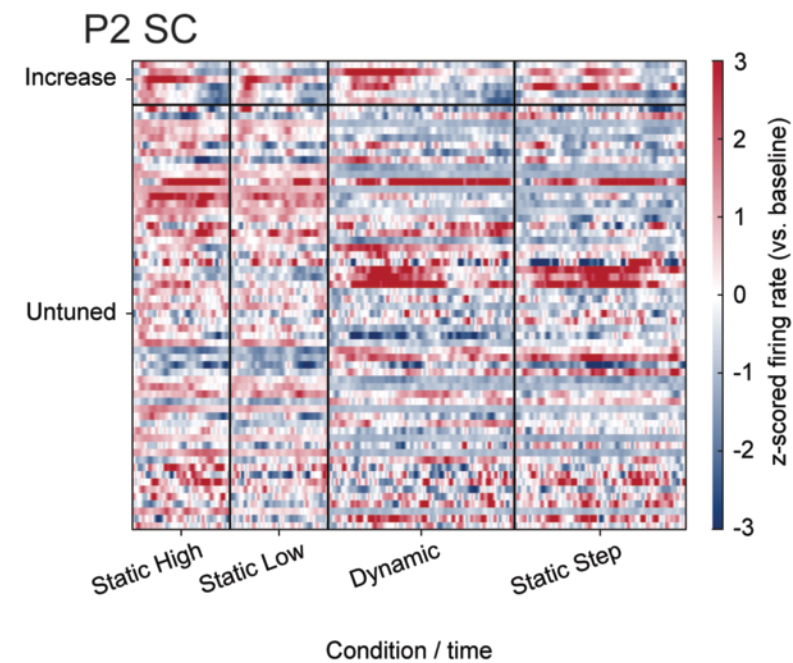
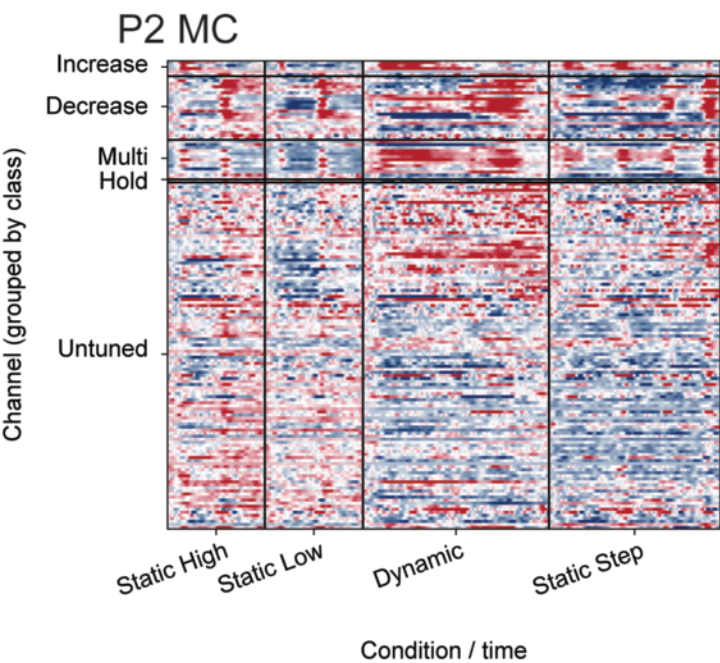
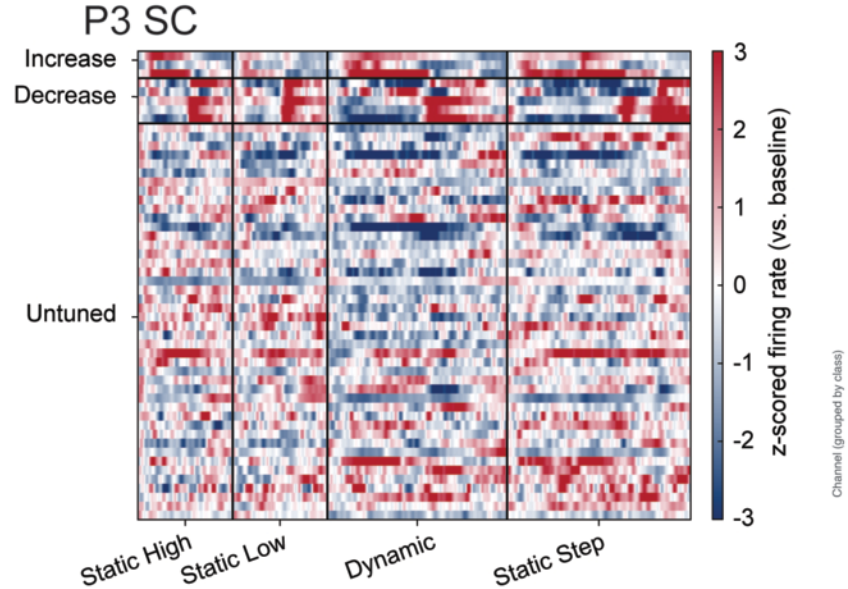
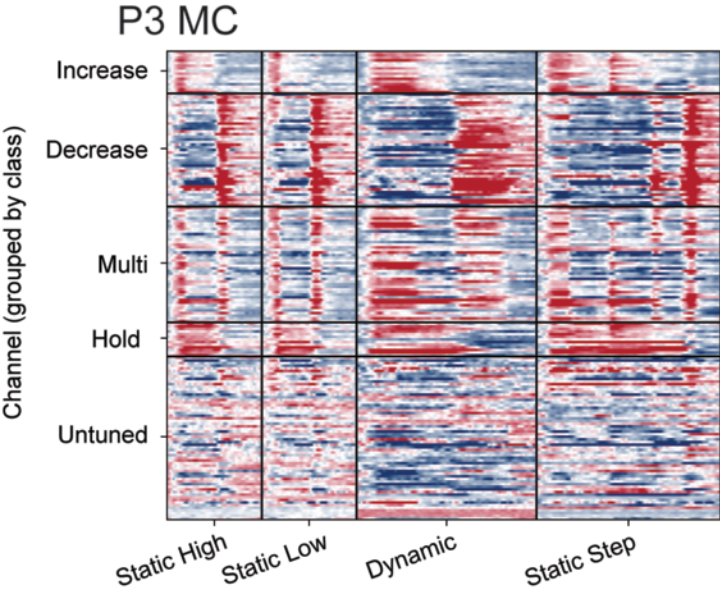
Figure S1: Per-channel firing-rate heatmaps grouped by response class. Trial-averaged spike rates are shown for each channel (rows) across four grasping conditions (columns: Static High, Static Low, Dynamic, Static Step) and four panels — one per (participant × region): A) P3 MC, B) P3 SC, C) P2 MC, D) P2 SC. Each channel is z-scored against its own pooled pre-cue baseline (first 75 bins of every condition block, ~1.5 s pre-cue at 20 ms/bin); the color scale shows ± 3 SD relative to that baseline (deep blue = decrease, deep red = increase). Within each panel, channels are grouped vertically by their consensus response class identified via the K-means clustering described in Fig. 2 (Increase, Decrease, Multi-transient, Hold, Untuned). Vertical white dividers separate condition blocks; horizontal dividers separate response-class groups. Channel-class assignments are pooled across the three sessions per participant analyzed in Fig. 2.

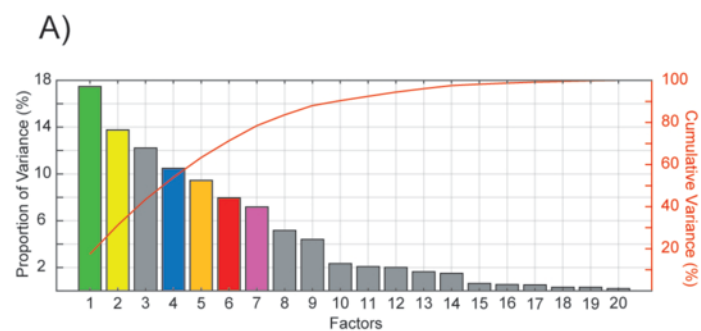
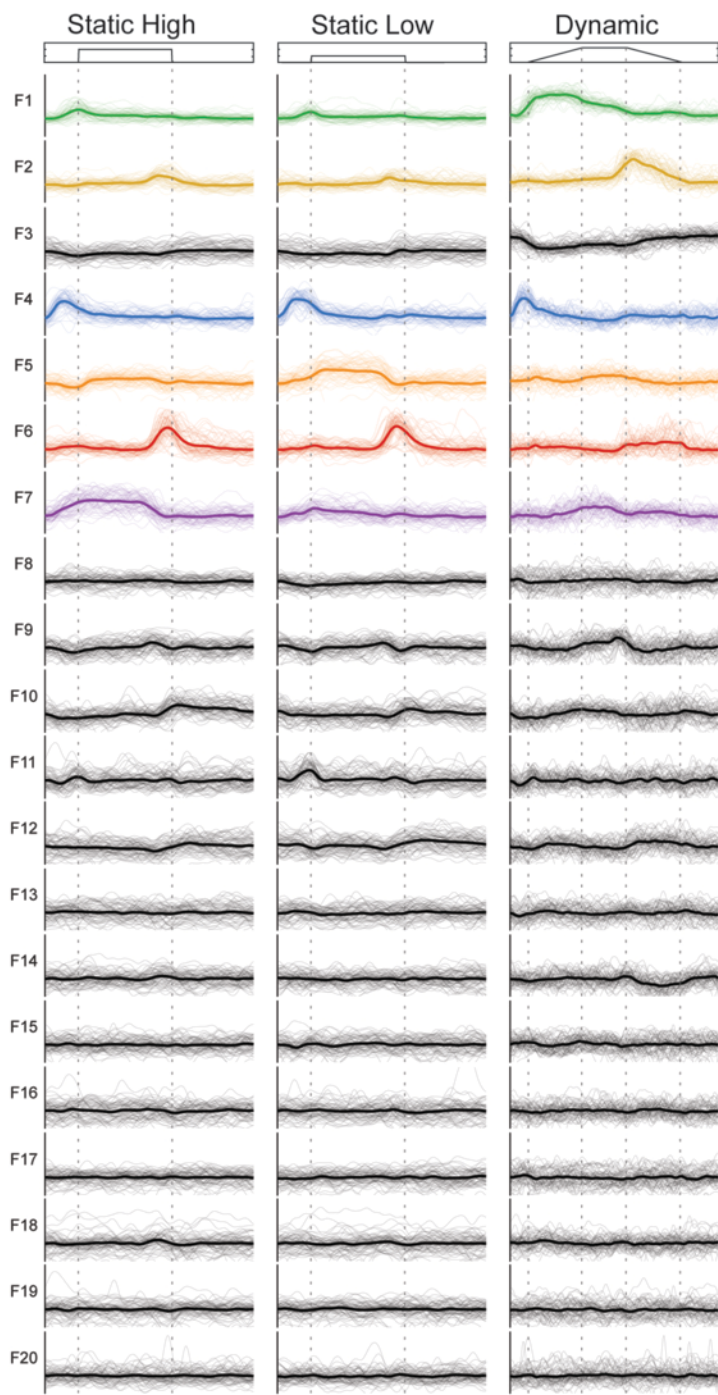
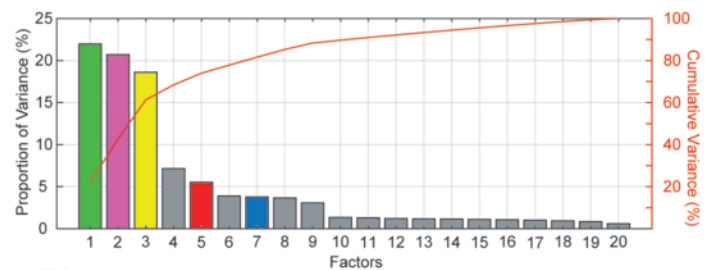
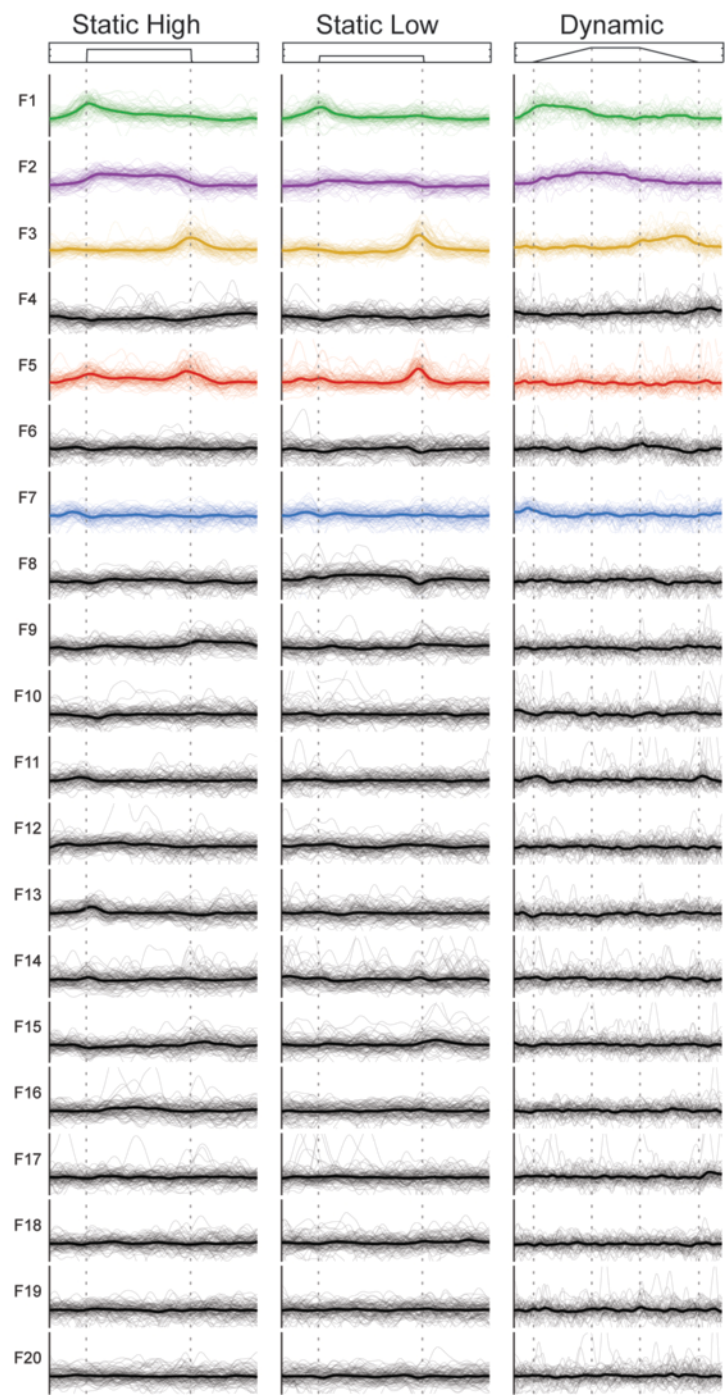
Figure S2: Factor analysis of MC activity. A & C) Scree plots showing the proportion of variance explained by each of the 20 factors (bars, left axis) and the cumulative variance explained (red line, right axis) for participants P3 (A) and P2 (C). Bars corresponding to task-relevant factors identified in Fig. 3 are highlighted in color (green = onset, gold = hold-low, blue = hold-high, orange = increase, red = decrease, purple = offset); remaining factors are shown in gray. B & D) Single-trial factor traces for P3 (B) and P2 (D), shown for each of the 20 factors (rows F1–F20) across three grasping conditions (columns: Static High, Static Low, Dynamic). Faint traces show individual trials pooled across all sessions; bold traces show the across-trial average for that condition. Vertical dotted lines mark grasp event boundaries (cue, grasp onset, grasp offset). Factors highlighted in color correspond to the labeled task-relevant modes identified in Fig. 3 and use the same color assignments as in panels A & C; all other factors are drawn in black.

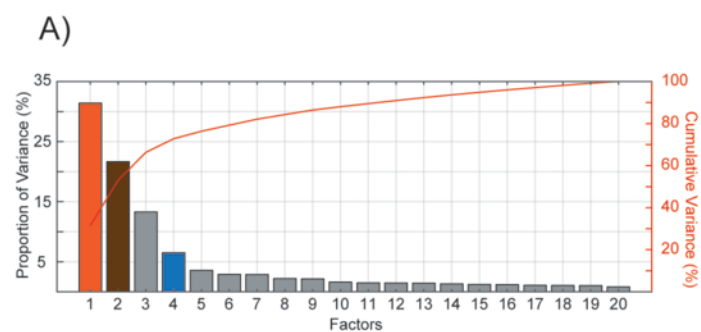
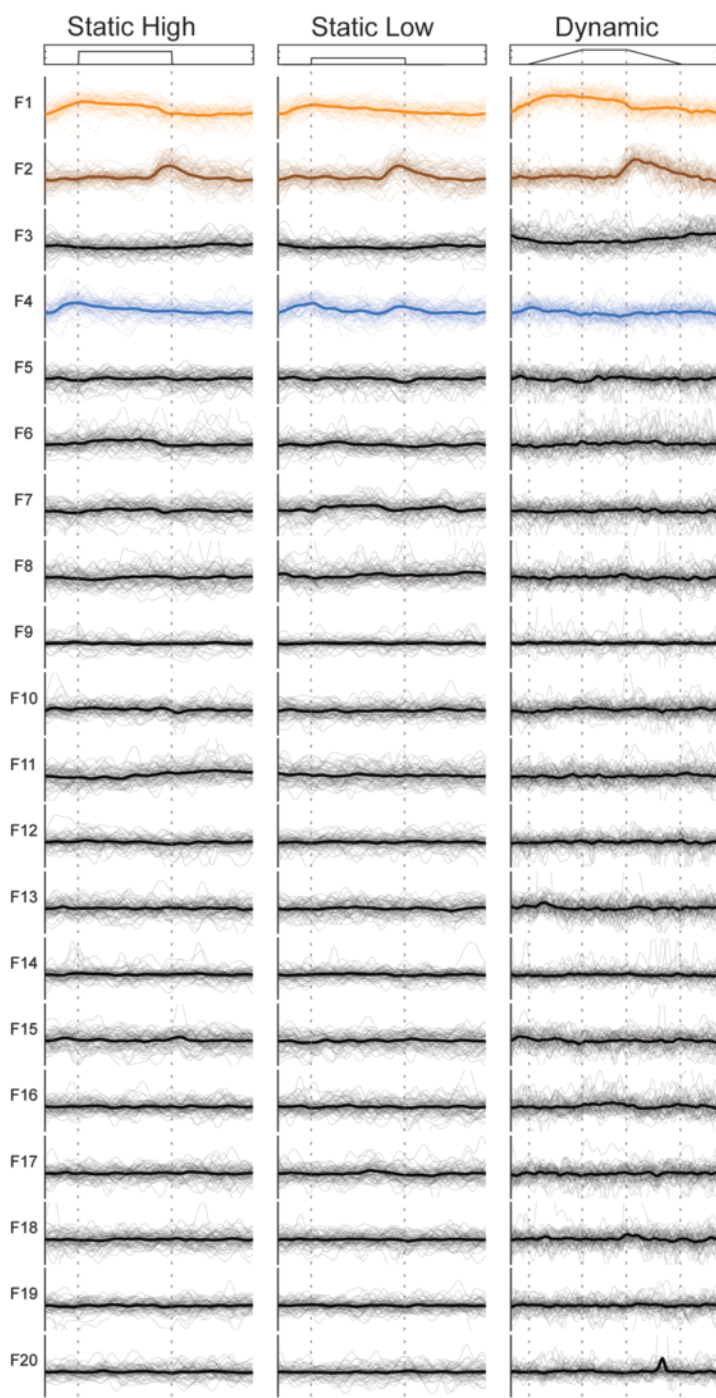
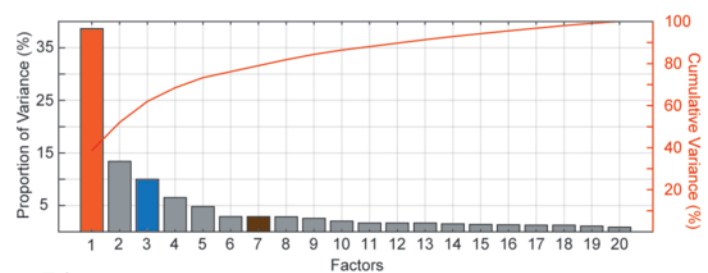
Figure S3: Factor analysis of SC activity. A & C) Scree plots showing the proportion of variance explained by each of the 20 factors (bars, left axis) and the cumulative variance explained (red line, right axis) for participants P3 (A) and P2 (C). Bars corresponding to task-relevant factors identified in Fig. 4 are

25 highlighted in color (orange = onset, blue = increase, red = decrease); remaining factors are shown in
26 gray. B & D) Single-trial factor traces for P3 (B) and P2 (D), shown for each of the 20 factors (rows F1–
27 F20) across three grasping conditions (columns: Static High, Static Low, Dynamic). Faint traces show
28 individual trials pooled across all sessions; bold traces show the across-trial average for that condition.
29 Vertical dotted lines mark grasp event boundaries (cue, grasp onset, grasp offset). Factors highlighted in
30 color correspond to the labeled task-relevant modes identified in Fig. 4 and use the same color
31 assignments as in panels A & C; all other factors are drawn in black.

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P3**B)****P2****C)****D)**

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