

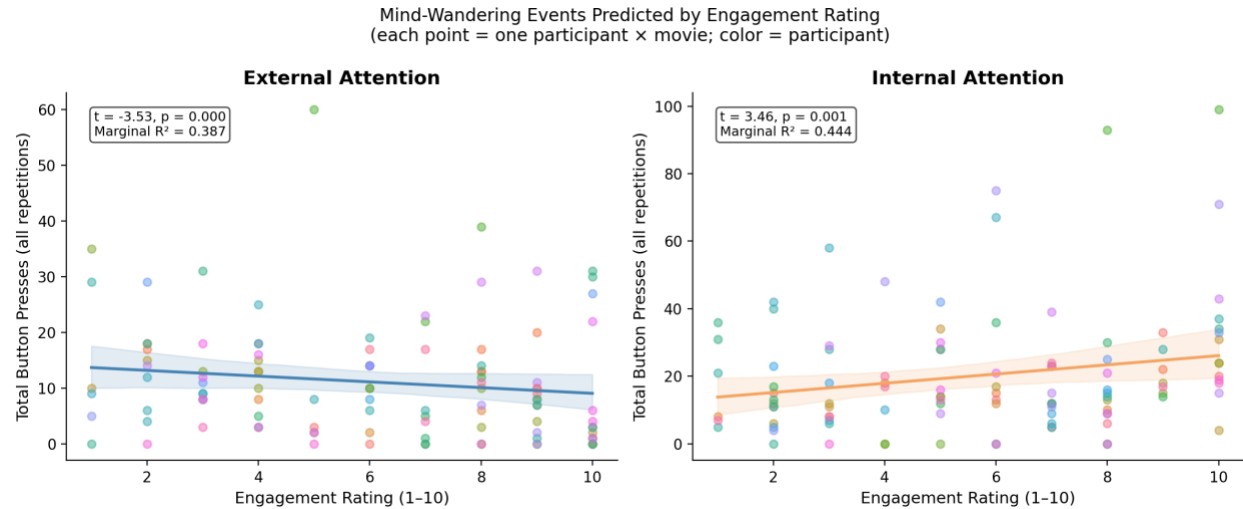


Figure S1. Association between participant-specific engagement ratings and mind-wandering frequency. Each point represents one participant $\times$ video combination. Engagement ratings (x-axis; 1–10 scale) were collected for each video at the end of the session. Button press counts (y-axis) are summed across all four repetitions for that video. Left panel: External attention condition. Right panel: Internal attention condition. Regression lines are fit by ordinary least squares with 95% bootstrap confidence bands. Model statistics (fixed effect of engagement, marginal R^2) from a linear mixed-effects model (button presses $\sim$ engagement rating + (1|participant)) are annotated in each panel.

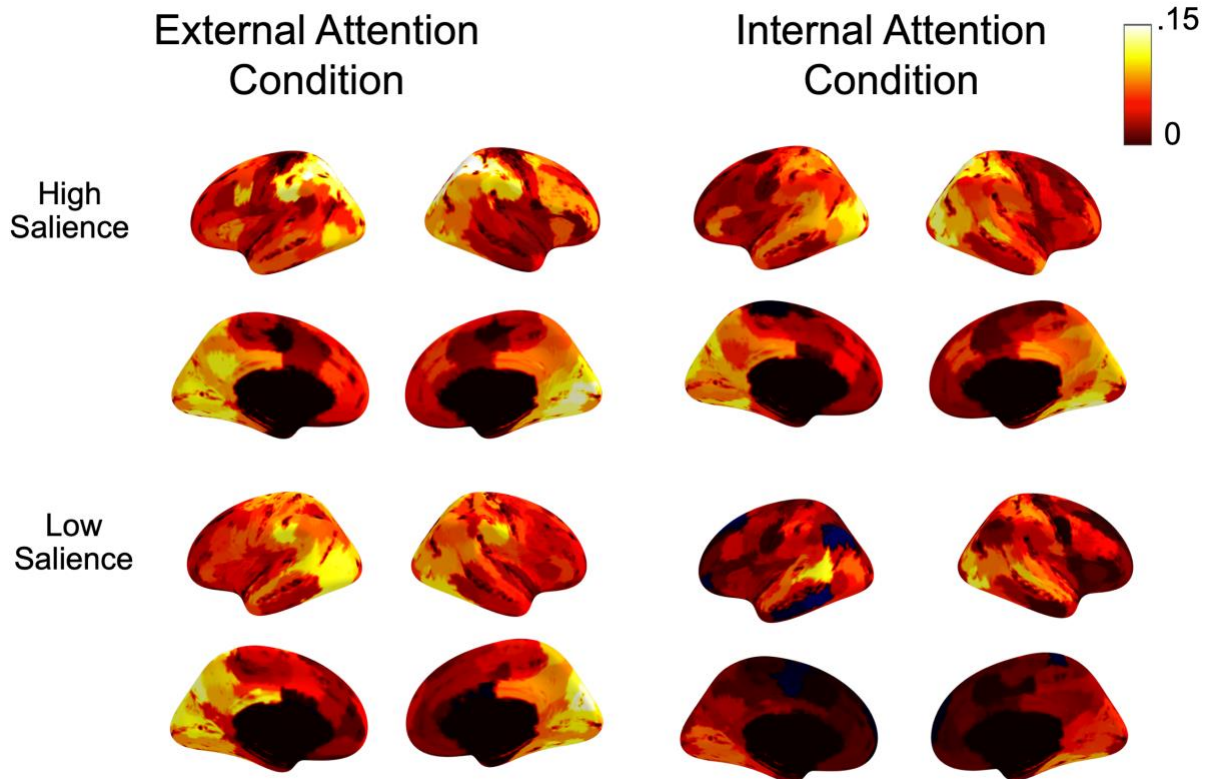


Figure S2. Difference in unthresholded mean Inter-Subject Correlation (ISC) values when subtracting repetition 1 from repetition 4 across 200 brain regions. Larger decreases in ISC from repetition 1 to repetition 4 are illustrated in warmer colors. Darker regions show less change in ISC over time. The left column identifies differences when attention is directed externally and the right column shows when attention was directed internally. Difference values are averaged across high salience (top row) and low salience (bottom row) videos.

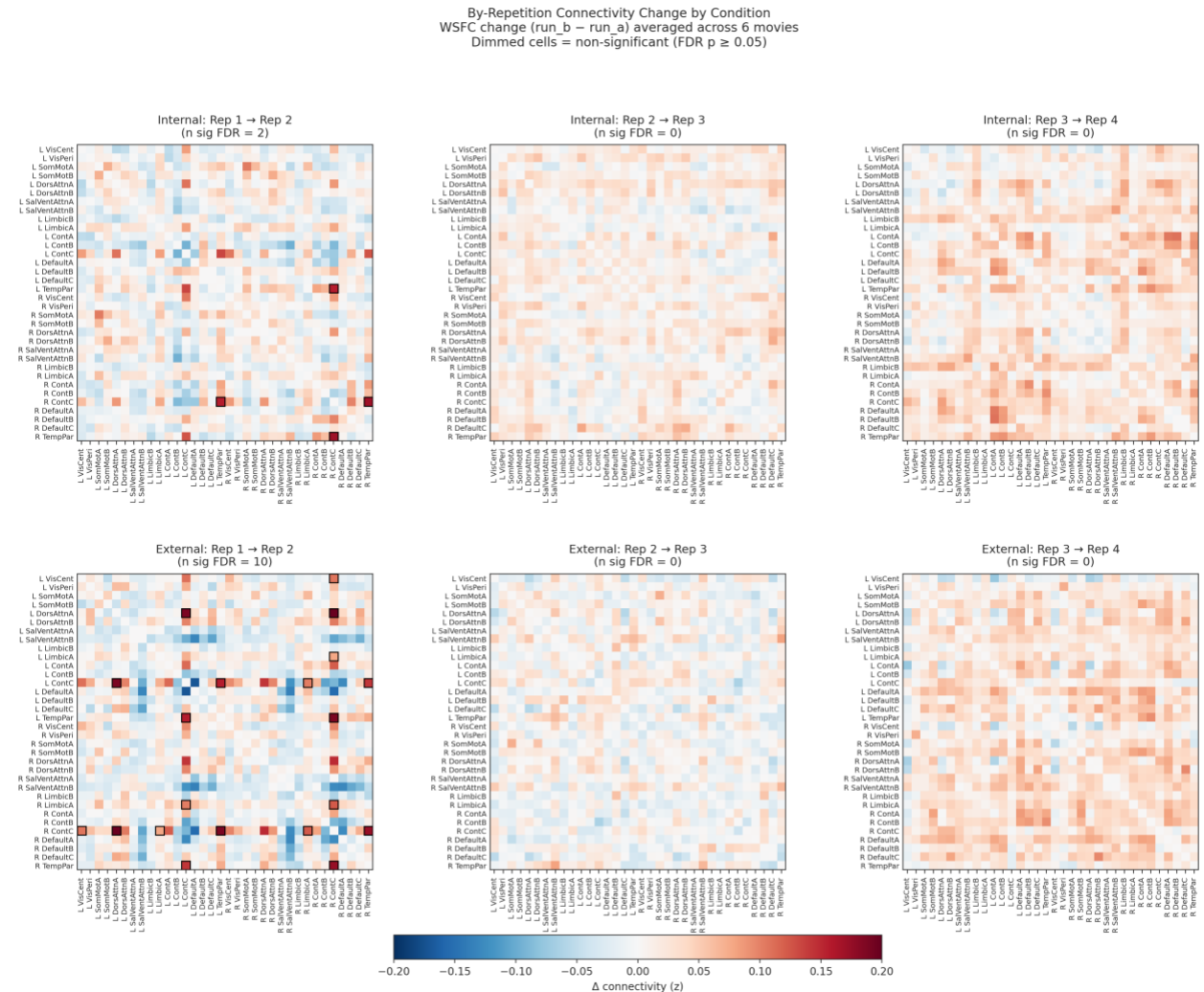


Figure S3. Within-subject functional connectivity (WSFC) change across consecutive repetitions, separately for internal (top row) and external (bottom row) attention conditions. Each matrix shows the change in Fisher z-transformed network-to-network connectivity from one repetition to the next (Δ WSFC = run_b – run_a), averaged across all six videos. Rows reflect the 34 cortical networks derived from the Schaefer 200-parcel, 17-network atlas. Warmer colors indicate increased connectivity; cooler colors indicate decreased connectivity. Black outlines indicate network pairs whose connectivity change was statistically significant after FDR correction (Benjamini-Hochberg, $q < 0.05$) across 10,000 sign-flip permutations. The number of FDR-significant connections is reported in each panel title.

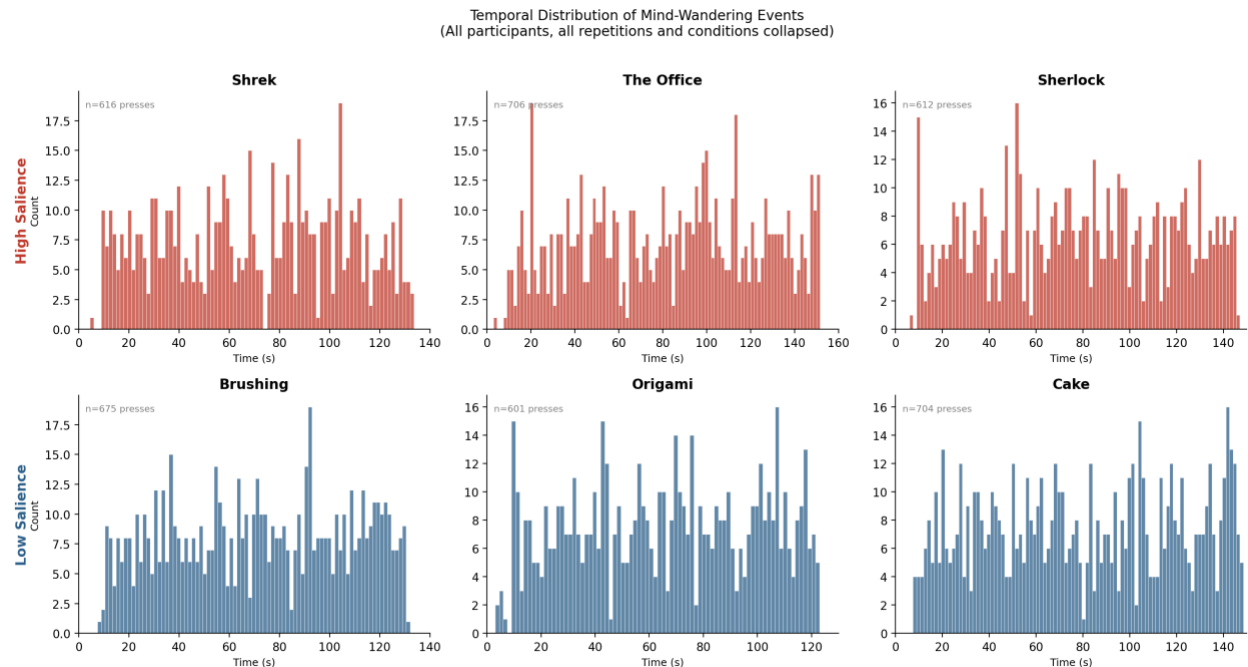


Figure S4. Temporal distribution of mind-wandering events during each video clip. Each subplot shows a histogram (bin width = 1.5 s) of button press timestamps collapsed across all participants, repetitions, and attention conditions. Top row: high-salience clips (Shrek, The Office, Sherlock). Bottom row: low-salience clips (Brushing, Origami, Cake). The x-axis represents time from clip onset (seconds); the y-axis represents the count of button presses falling within each 1.5-s bin. Total press counts (n) are annotated in the upper-left corner of each subplot.

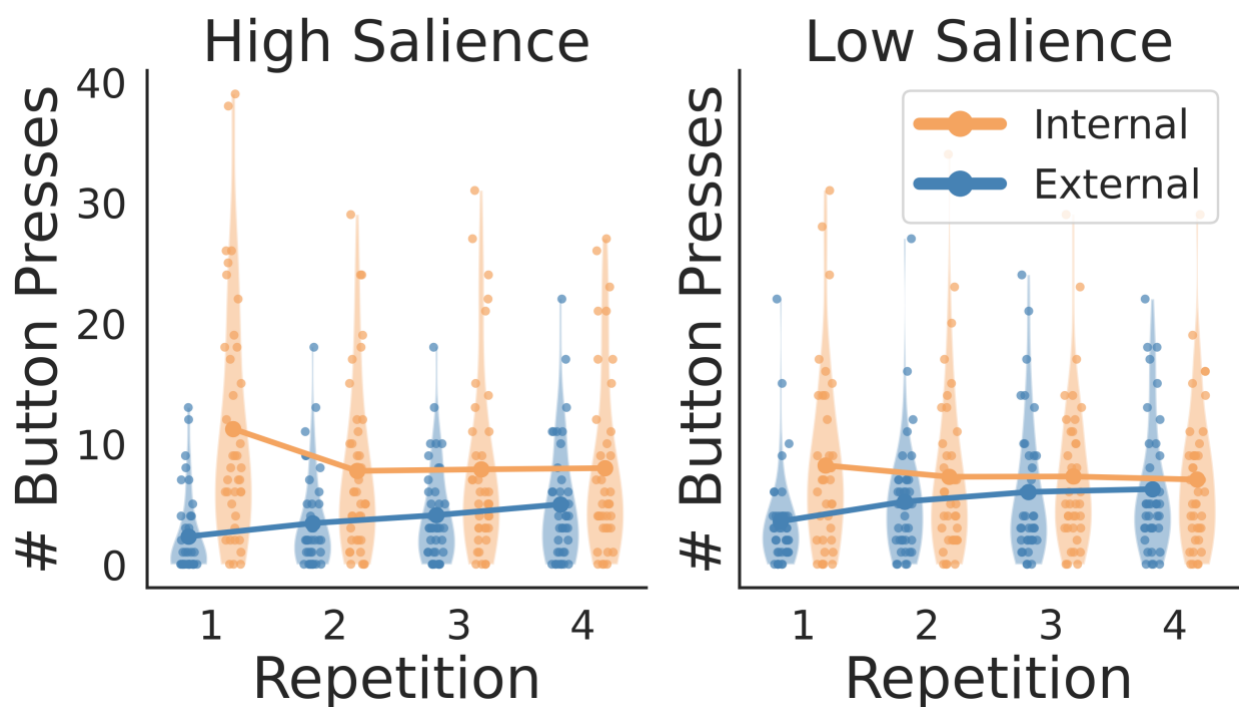


Figure S5. Button press counts by video, condition, and repetition. Each subplot corresponds to one video clip, arranged by salience row (top: high salience; bottom: low salience). Within each subplot, External attention (steelblue) and Internal attention (sandybrown) conditions are plotted side by side at each repetition (1–4). Violin shapes show the distribution of individual participant counts; overlaid points represent individual data. Connected markers show the group mean trajectory. Error bands reflect ± 1 SEM.

Table 1S. Meta-awareness (0-3s before button press)

Contrast	Harvard-Oxford Label	x	y	z	Peak Z
External-Internal	Paracingulate Gyrus	3.5	16.27	34.3	5.5162158 8
External-Internal	Orbital Frontal Cortex	-24.41	52.33	-10.27	4.7434977 8
External-Internal	Lateral Occipital Cortex, inferior division	14.89	-65.74	8.34	-3.6232985
External-Internal	Inferior Temporal Gyrus, posterior division	-47.37	-50	-17.17	-3.6296438
External-Internal	Lateral Occipital Cortex, superior division	-37.18	-84.24	-19.77	-3.6561956
External-Internal	Supracalcarine Cortex	-18.09	-89.33	-4.01	-3.66054
External	Paracingulate Gyrus	8.77	14.76	37.2	14.444806
External	Parahippocampal Gyrus, anterior division	17.82	-23.3	-14.23	12.756695 3
External	Background	-49.42	-54.71	64.14	10.478894 3
External	Background	-31.28	19.76	88.9	10.397819 6
External	Cuneal Cortex	-26.89	5.63	-14.92	10.365106 9.0498992
External	Angular Gyrus	-18.36	-68.24	37.48	2 8.9313815
External	Subcallosal Cortex	-10.53	48.25	-3.63	6 8.6268440
External	Background	-11.93	-41.2	108.59	6
External	Background	-32.1	-18.26	32.27	8.6068535 7.7240238
External	Middle Temporal Gyrus, posterior division	-57.15	-55.27	-6.39	6 6.8672522
External	Background	-8.78	46.34	76.62	5 6.8595775
External	Background	-2.41	-47.6	-34.99	4 6.6240263
External	Background	-64.71	6.19	91.07	1 5.7484685
External	Background	-14.62	-17.42	109	8

External	Cingulate Gyrus, anterior division	-7.59	-25.57	34.81	5.6426425 5.5780974
External	Superior Frontal Gyrus	-31.24	11.03	56.19	2
External	Cingulate Gyrus, posterior division	2.98	-53.54	49.62	5.0987606 5.0518380
External	Frontal Operculum Cortex	-31.56	8.75	17.57	2
External	Temporal Fusiform Cortex, posterior division	-39.96	-61.22	-22.08	-3.621811
External	Background	-39.45	-58.35	97.08	-3.6224151
External	Parahippocampal Gyrus, posterior division	1.3	-75.07	5.06	-3.623861
External	Background	-0.39	-4.06	101.97	-3.6262142
External	Angular Gyrus	15.24	-60.27	71.12	-3.628873
External	Inferior Frontal Gyrus, pars opercularis	18.09	-24.32	43.53	-3.6305018
External	Background	-61.68	-76.95	-10.74	-3.636219
External	Background	-32.88	-89.48	72.84	-3.6378414
External	Inferior Frontal Gyrus, pars opercularis	13.41	-22.19	79.11	-3.6403602
External	Insular Cortex	17.82	-10.97	69.8	-3.642987
External	Background	-22.1	39.14	94.98	-3.6565902
External	Inferior Frontal Gyrus, pars opercularis	27.54	-22.02	66.88	-3.6689101
External	Background	-18.21	14.45	17.99	-3.7499133 12.435755
Internal	Subcallosal Cortex	9.69	13.18	37.6	7 11.988935
Internal	Background	-3.98	-10.42	-14.04	6 10.878572
Internal	Background	-30.48	18.7	88.61	2 10.460047
Internal	Background	-30.06	-18.9	32.38	8 8.9387256
Internal	Subcallosal Cortex	-8.14	47.01	-1.3	6 8.6734605
Internal	Angular Gyrus	-28.5	-67.7	46	3 8.2436752
Internal	Background	-8.99	47.62	76.86	4 7.6366671
Internal	Background	-4.36	-45.58	-35.32	8 7.1663935
Internal	Middle Temporal Gyrus, posterior division	-55.69	-54.67	-9.39	1 6.9861368
Internal	Out of bounds	-11.56	-41.96	110.32	1 5.9686550
Internal	Background	-64.1	4.18	89.9	9 5.8951481
Internal	Cingulate Gyrus, anterior division	-7.38	-23.78	37.32	7

Internal	Background	10.9	3.33	88.38	5.5217012 9
Internal	Cingulate Gyrus, anterior division	5.1	-24.9	25.18	5.1902014 1
Internal	Superior Parietal Lobule	-64.49	-26.92	34.16	5.0457936 4
Internal	Background	9.22	17.19	4.72	-3.6236263
Internal	Parahippocampal Gyrus, posterior division	0.91	-76.49	-10.2	-3.6247497
Internal	Background	-40.29	50.22	37.25	-3.6364961
Internal	Out of bounds	-47.67	-7.94	112.43	-3.6415124
Internal	Background	-7.52	-64.38	97.2	-3.6573148

Table 2. Reorienting (0-3s after button press)

Contrast	Harvard-Oxford Label	x	y	z	Peak Z
External-Internal	Cingulate Gyrus, posterior division	-14.91	-59.22	21.53	-3.6283203
External	Insular Cortex	19.76	34.23	40.06	8.52121842
External	Background	-17.44	-3.4	27.89	7.7371325
External	Background	-50.03	-81.62	69.35	7.2578854
External	Supracalcarine Cortex	-1.74	-90.95	39.57	6.64754054
External	Background	-12.19	40.49	38.5	6.35997605
External	Cingulate Gyrus, anterior division	-6.5	-24.93	37.21	6.21762746
External	Background	-5.36	59.7	63.41	6.11157213
External	Background	-31.74	53.25	90.21	5.97870669
External	Background	-32.93	-101.37	38.71	5.71929701
External	Lateral Occipital Cortex, superior division	-53.49	-79.08	-3.63	5.51898563
External	Parahippocampal Gyrus, anterior division	18.05	-25.16	-10.15	-3.6218116
External	Planum Polare	-47.4	-16.09	6.65	-3.6218602
External	Paracingulate Gyrus	12.08	4.41	34.06	-3.622011
External	Background	18.93	-26.74	87	-3.6220902
External	Lateral Occipital Cortex, inferior division	8.89	-72.66	7.68	-3.6224511
External	Temporal Fusiform Cortex, posterior division	-42.24	-56.47	-28.12	-3.6226599
External	Out of bounds	-14.02	3.35	110.57	-3.6227391
External	Postcentral Gyrus	-22.54	-55.37	35.74	-3.6235547
External	Background	-14.62	-22.92	-14.41	-3.6265359
External	Background	-7.7	4.2	-36.18	-3.6271112
External	Angular Gyrus	21.1	-65.1	47.02	-3.6273443

External	Frontal Pole	-28.3	19.4	-7.58	-3.6392687
External	Background	-28.8	-21.28	25.09	-3.6413343
External	Background	-39.46	47.86	34.19	-3.6425497
External	Background	-29.55	26.65	74.5	-3.6472394
External	Background	-14	-21.88	92.66	-3.6476029
External	Heschl's Gyrus (includes H1 and H2)	-45.34	-36.16	6.68	-3.6800152
External	Paracingulate Gyrus	-2.99	37.57	-2.2	-3.6934057
Internal	Insular Cortex	-16.16	-1.59	56.5	6.04041175
Internal	Background	-14.74	-8.16	18.61	5.76841163
Internal	Inferior Frontal Gyrus, pars opercularis	-32.23	-9.19	72.27	5.45952105
Internal	Background	-6.29	63.54	58.88	4.98045625
Internal	Lateral Occipital Cortex, superior division	-52.46	-80.48	-13.01	4.93219535
Internal	Background	-45.64	-92.32	59.53	4.88009019
Internal	Background	14.16	44.54	46.24	4.70680567
Internal	Paracingulate Gyrus	12.05	5.55	32.56	-3.6220326
Internal	Background	17.36	-24.66	-10.93	-3.6253476
Internal	Background	-14.42	-23.43	-16	-3.6284277
Internal	Inferior Frontal Gyrus, pars opercularis	-14.49	-23.19	85.92	-3.6299481
Internal	Insular Cortex	25.6	1.99	53.91	-3.6304978
Internal	Inferior Temporal Gyrus, temporooccipital part	25.51	-34.95	49.59	-3.635742
Internal	Frontal Pole	-28.06	23.97	-2.92	-3.6358121
Internal	Background	9.06	-25.48	93.18	-3.6387819
Internal	Frontal Pole	-29.08	-24.42	20.4	-3.6528618
Internal	Supramarginal Gyrus, anterior division	-48.55	-50	57.05	-3.6621735
Internal	Background	-27.65	25.36	76.79	-3.6733896
Internal	Inferior Temporal Gyrus, temporooccipital part	-27.04	-38.04	54.02	-3.7048262

Post-hoc Power Analysis

To evaluate the statistical adequacy of our sample ($N = 39$), we conducted a post-hoc power analysis for all primary behavioral analyses ($\alpha = 0.05$, two-tailed). Effect sizes were computed as partial η^2 for mixed-effects model terms and Cohen's d for pairwise comparisons. For ISC and functional connectivity analyses, Fisher z -transformed correlations serve as effect size analogs; separate post-hoc power estimates were not computed for permutation-based tests.

Pairwise comparisons and engagement models were well-powered across the board. Button press rates differed significantly between external and internal attention conditions ($d = 0.72$, power = 0.993), between high and low salience videos in the external condition ($d = 0.68$, power

= 0.986) and internal condition ($d = 0.55$, power = 0.915), and between the first and fourth repetition in both external ($d = 0.84$, power = 0.999) and internal ($d = 0.56$, power = 0.924) conditions. Models relating engagement ratings to button press rates were similarly well-powered for both external ($\eta^2 = 0.095$, power = 0.916) and internal ($\eta^2 = 0.095$, power = 0.914) conditions.