

Supplementary Material

Univariate Analysis:

In addition to mean amplitude levels across ROIs (Figure 2 c), we investigated univariate effects in a “traditional” mass-univariate analysis. Calculating the contrasts for the different MI conditions against the rest condition, we found several activation sites that captured broad areas within the premotor as well as within the posterior parietal section. More precisely, we found activation for imagined aiming movements compared to rest capturing the left dorsal premotor area as well as the adjoining pre-SMA, the SMA proper, the SPL, and the IPL of the left hemisphere. For motor imagery of extension–flexion movements, we found activation clusters capturing the left pre-SMA and SMA proper as well as the ventral section of the premotor area of the left hemisphere. For posterior parietal sections, we found no activation cluster passing the threshold. Furthermore, we found activation clusters for imagined squeezing movements within the dorsal and ventral section of the PMC of the left hemisphere, the pre-SMA, the SMA proper, as well as within the left IPL (Area PF) and the posterior section of the left SPL (Area 7P) (Fig. S1).

To detect whether the different hand movements are mapped action-specifically within the premotor area and the posterior parietal area, we contrasted the different action conditions to define action-specific sections within our ROIs. Calculating the respective contrasts (Imagery Squeezing vs. [Imagery Aiming + Imagery Extension–Flexion]; Imagery Aiming vs. [Imagery Squeezing + Imagery Extension–Flexion]; Imagery Extension–Flexion vs. [Imagery Squeezing + Imagery Aiming]) revealed clearly defined action-specific sections associated specifically with squeezing movements in an activation cluster that captured area 7a of the superior posterior parietal lobe of the left hemisphere. Furthermore, activation sites specific

for imagined squeezing movements were detected within the SMA proper of the right hemisphere. We found action-specific activation associated with extension–flexion movements in the parietal operculum of the right hemisphere. We did not find any activation sites within the predefined ROIs for aiming movements that passed the statistical threshold (Fig S1). All results and the specific coordinates of the single activation clusters are summarized in Table S1.

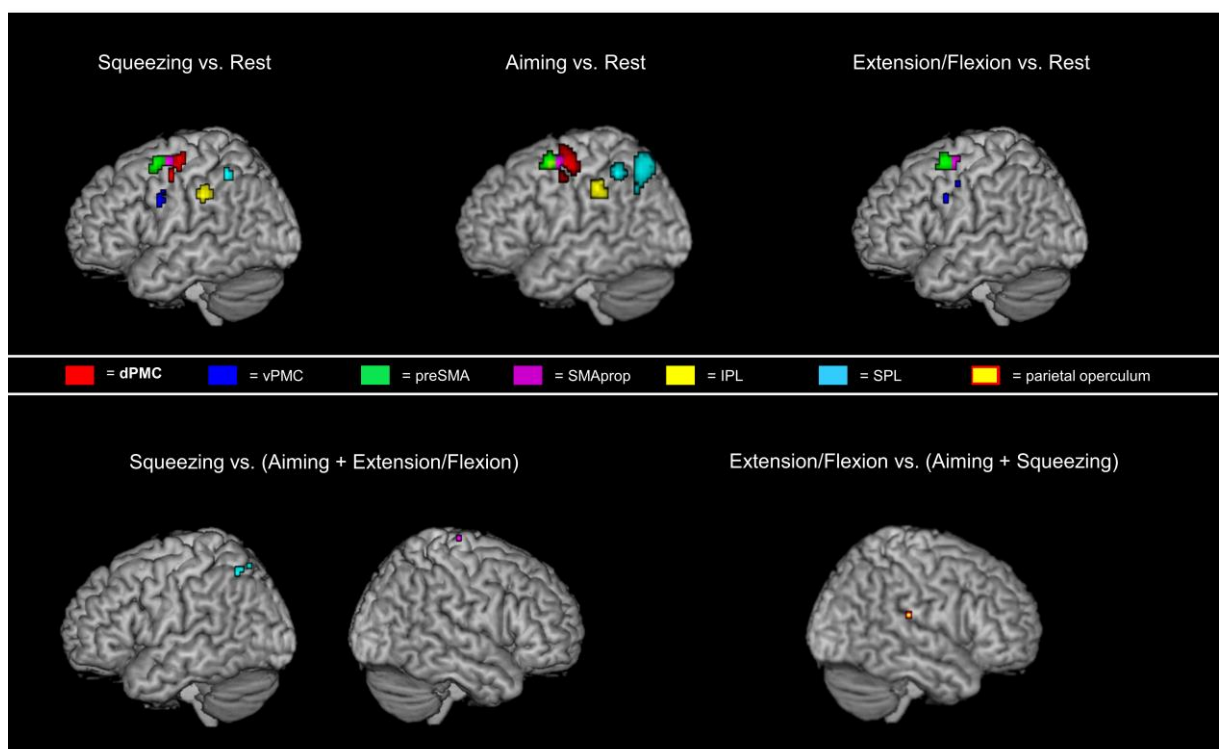


Figure S1. Results of the univariate ROI analysis. Colors indicate significantly activated clusters within the respective regions of interest as follows: red: dorsal premotor cortex, blue: ventral premotor cortex, green: preSMA, violet: SMAproper, yellow: IPL, turquoise: SPL, yellow with red frame: parietal operculum.

Table S1 Results of the univariate ROI analysis

	Left/Right	Cluster size	MNI coordinates of max. <i>t</i> value			<i>max. t</i> value
			<i>X</i>	<i>y</i>	<i>z</i>	
<i>Aiming vs. Rest</i>						
IPL (PF)	L	68	-51	-34	43	4.17
SPL (7a)	L	74	-24	-67	55	5.25
SPL (7PC)	L	14	-12	-73	55	3.63
SPL (7P)	L	8	-36	-49	55	4.87
SMA(prop)	L	47	-6	-4	58	4.82
dPMC	L	280	-21	-10	58	6.88
preSMA	L	56	-6	5	58	4.86
<i>Extension–Flexion vs. Rest</i>						
SMA(prop)	L	45	-6	-4	58	4.83
preSMA	L	61	-6	5	58	5.49
vPMC	L	42	-57	2	34	3.87
<i>Squeezing vs. Rest</i>						
IPL (PF)	L	66	-57	-31	37	4.92
SPL (7p)	L	6	-36	-49	55	4.1
SMA(prop)	L	60	-6	-4	58	4.34
dPMC	L	266	-42	-7	52	4.96
preSMA	L	61	-6	5	58	5.2
vPMC	L	46	-57	2	34	4.34
<i>Squeezing vs. (Extension–Flexion+Aiming)</i>						
SPL (7a)	L	104	-21	-61	52	4.34
SMA(prop)	R	11	9	-22	76	4.43
<i>Extension–Flexion vs. (Aiming+Squeezing)</i>						
Parietal Operculum	R	6	42	-28	19	3.86

$P < 0.05$, FWE-corrected in ROIs. For abbreviations, see text.

ROI sizes

Table S2: Sizes of the Region of Interest

	N	Minimum	Maximum	Mean	SD
M1_r	20	129,00	254,00	180,5000	28,29450
M1_l	20	138,00	232,00	182,3000	28,95205
dPMC_r	20	48,00	108,00	81,2000	16,77906
dPMC_l	20	39,00	129,00	75,8500	19,96649
vPMC_r	20	68,00	140,00	101,5000	22,72837
vPMC_l	20	73,00	127,00	95,5000	15,88279
IPS_r	20	122,00	255,00	197,7000	36,48374
IPS_l	20	159,00	227,00	195,4000	19,24195
SPL_r	20	122,00	208,00	159,9500	25,70577
SPL_l	20	135,00	238,00	187,8000	25,71422
IPL_r	20	128,00	229,00	180,0000	32,26045
IPL_l	20	136,00	249,00	189,5500	28,99269
Premotor_r	20	118,00	234,00	182,7000	29,05367
Premotor_l	20	114,00	240,00	171,3500	30,13527
Parietal_l	20	444,00	671,00	572,7500	58,42573
Parietal_r	20	382,00	673,00	537,6500	81,42951