

Specific brain activation patterns associated with two neuromuscular electrical stimulation protocols

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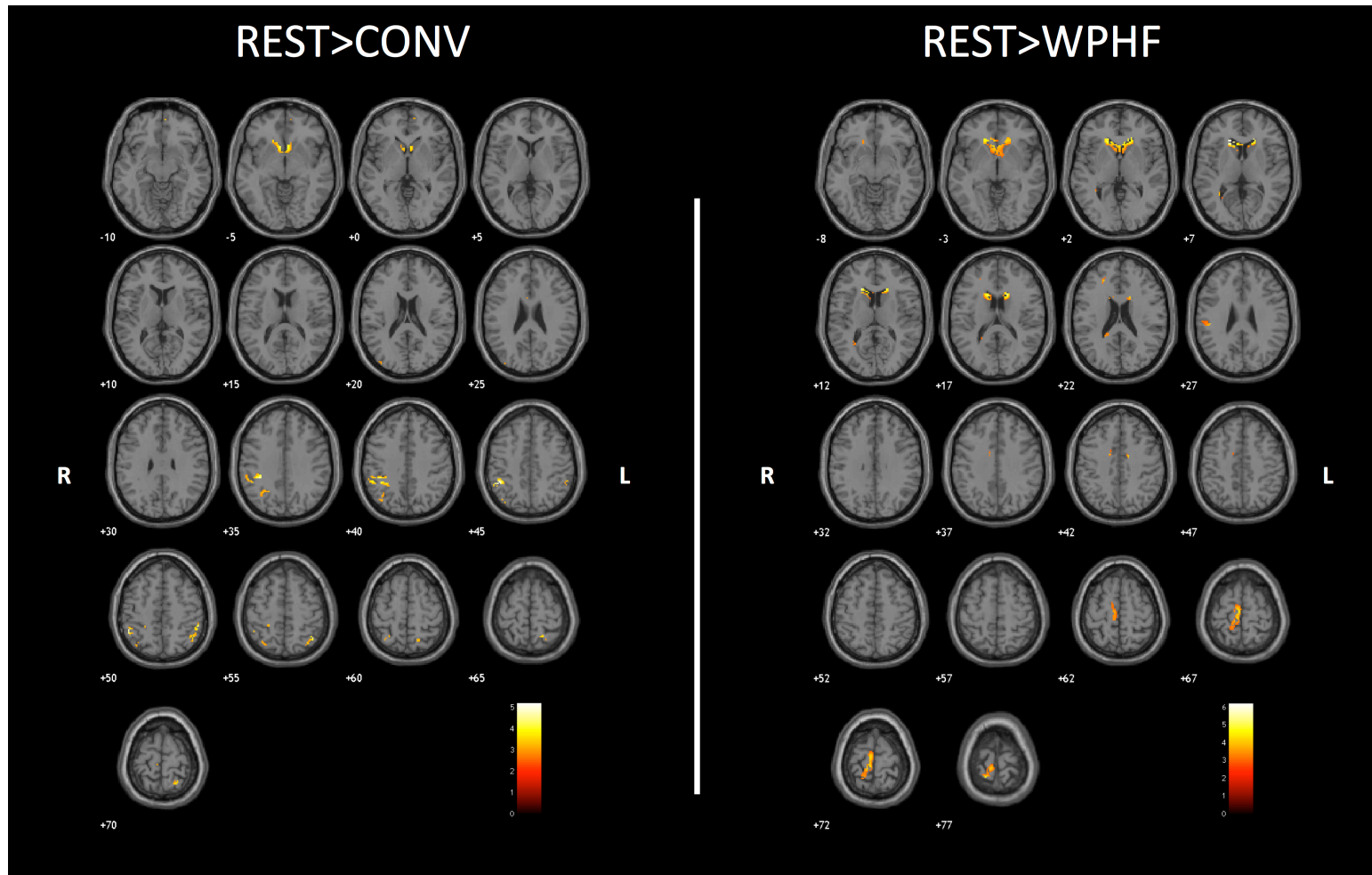
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Supplemental Figure 1. Group deactivation maps ($p < 0.005$; $k = 20$; FDR corrected at cluster level $p < 0.05$) during CONV and WPHF protocols performed at 10% of maximal voluntary contraction force as compared to rest. Statistical maps were coregistered with the SPM-MNI single subject T_1 images. The color scale represents the T values. R: right hemisphere; L: left hemisphere.

SUPPLEMENTAL TABLE 1 - Brain regions activated during VOL, CONV and WPHF protocols compared to rest *when considering the respective mean force as a regressor* ($p < 0.005$; $k = 20$; FDR corrected at cluster level $p < 0.05$)

Protocols	Regions (Brodmann area)	Side	Cluster size (k)	MNI coordinates			T
				x	y	z	
VOL>REST	<i>Posterior cerebellum</i>	R	28835	38	-68	-18	7.98
	<i>Precentral gyrus (4)</i>	L		-34	-18	54	7.75
	<i>Posterior cerebellum</i>	R		46	-60	-22	7.73
	<i>Middle occipital gyrus (19)</i>	R		26	-84	14	7.09
	<i>Fusiform gyrus (37)</i>	L		-50	-64	-14	6.83
	<i>Fusiform gyrus (19)</i>	L		-24	-64	-6	6.62
	<i>Orbital gyri (18)</i>	L		-38	-84	4	6.59
	<i>Anterior cerebellum</i>	L		-6	-46	0	6.47
	<i>Putamen</i>	R		32	-10	-8	6.46
	<i>Cuneus (18)</i>	L		-22	-94	14	6.38
	<i>Posterior cerebellum</i>	R		26	-78	-14	6.28
	<i>Precuneus (7)</i>	L		-4	-56	50	6.27
	<i>Lingual gyrus (17)</i>	R		18	-90	-4	6.27
	<i>Lingual gyrus (18)</i>	L		-22	-90	4	6.24
	<i>Middle occipital gyrus (19)</i>	R		34	-74	0	6.23
	<i>Putamen</i>	L		-32	-16	-6	6.2
CONV>REST	<i>Lingual gyrus (19)</i>	L	6374	-28	-68	-8	6.53
	<i>Anterior cerebellum</i>	L		-2	-42	-24	6.51
	<i>Posterior cerebellum</i>	R		22	-84	-16	6.48
	<i>Anterior cerebellum</i>	R		12	-56	-16	6.13
	<i>Anterior cerebellum</i>	L		-18	-58	-18	6.13
	<i>Lingual gyrus (18)</i>	R		6	-68	2	5.82
	<i>Posterior cerebellum</i>	L		-18	-72	-16	5.82
	<i>Anterior cerebellum</i>	R		10	-48	-6	5.77
	<i>Cerebellum</i>	R		4	-44	4	5.64
	<i>Posterior cerebellum</i>	R		22	-66	-18	5.62
	<i>Anterior cerebellum</i>	R		20	-62	-20	5.6
	<i>Posterior cerebellum</i>	R		28	-68	-22	5.42
	<i>Posterior cerebellum</i>	R		12	-72	-16	5.38
	<i>Posterior cerebellum</i>	L		-18	-66	-16	5.37
	<i>Orbital gyri (18)</i>	L		-38	-84	4	5.31
	<i>Lingual gyrus (18)</i>	L		-24	-56	0	5.15

(continued on next page)

Protocols	Regions (Brodmann area)	Side	Cluster size (k)	MNI coordinates			T	
				x	y	z		
CONV>REST	<i>Insula</i>	L	2126	-34	-20	10	6.21	
	<i>Inferior parietal lobule (40)</i>	L		-64	-16	12	5.94	
	<i>Putamen</i>	L		-30	-4	-10	5.46	
	<i>Superior temporal gyrus (22)</i>	L		-54	-10	-10	5.44	
	<i>Superior temporal gyrus (22)</i>	L		-56	-16	-8	5.12	
	<i>Superior temporal gyrus (22)</i>	L		-52	-16	-4	5.03	
	<i>Superior temporal gyrus (38)</i>	L		-46	8	-24	4.98	
	<i>Hippocampus</i>	L		-32	-8	-20	4.83	
	<i>Caudate nucleus</i>	L		-36	-22	-8	4.73	
	<i>Insula</i>	L		-44	-6	-6	4.47	
	<i>Hippocampus</i>	L		-28	-28	-8	4.37	
	<i>Putamen</i>	L		-30	14	-6	4.36	
	<i>Precentral gyrus (6)</i>	L		-48	-4	4	4.24	
	<i>Putamen</i>	L		-28	8	-6	4.19	
	<i>Inferior parietal lobule (40)</i>	L		-54	-22	14	3.88	
	<i>Caudate nucleus</i>	L		-34	-30	-2	3.87	
		<i>Caudate nucleus</i>	R	776	14	6	-14	6.15
		<i>Thalamus</i>	R		0	-6	0	5.92
		<i>Thalamus</i>	L		-4	-2	4	5.83
		<i>Thalamus</i>	R		8	-2	-8	5.07
	<i>Caudate nucleus</i>	L		-18	-4	18	3.44	
WPHF>REST	<i>Precentral Gyrus (4)</i>	L	4286	-60	-4	20	5.96	
	<i>Fusiform gyrus (19)</i>	L		-32	-64	-10	5.14	
	<i>Fusiform gyrus (19)</i>	L		-28	-66	-8	4.77	
	<i>Posterior cerebellum</i>	R		32	-70	-10	4.69	
	<i>Putamen</i>	L		-24	-18	8	4.68	
	<i>Parahippocampal gyrus (19)</i>	L		-26	-50	-6	4.67	
	<i>Lingual gyrus (18)</i>	L		-28	-40	-16	4.66	
	<i>Anterior cerebellum</i>	R		16	-78	-6	4.57	
	<i>Fusiform gyrus (37)</i>	L		-24	-44	-14	4.57	
	<i>Lateral globus pallidus</i>	L		-28	-20	0	4.38	
	<i>Parahippocampal gyrus (36)</i>	L		-30	-36	-14	4.37	
	<i>Middle temporal gyrus (22)</i>	L		-46	-30	4	4.31	
	<i>Anterior cerebellum</i>	L		-32	-52	-12	4.17	
	<i>Lingual gyrus (18)</i>	R		10	-86	8	4.15	
	<i>Fusiform gyrus (37)</i>	R		30	-42	-16	4.15	
	<i>Lingual gyrus (18)</i>	R		10	-86	0	4.14	

SUPPLEMENTAL TABLE 2 – Differences in brain activation between VOL and NMES protocols

($p < 0.005$; $k = 20$; FDR corrected at cluster level $p < 0.05$)

Contrasts	Regions (Brodmann area)	Side	Cluster size (k)	MNI coordinates			T
				x	y	z	
VOL>CONV	<i>Cuneus (17)</i>	R	14357	12	-92	4	7.57
	<i>Lingual gyrus (18)</i>	R		18	-90	0	7.41
	<i>Middle temporal gyrus (18)</i>	R		24	-88	8	6.7
	<i>Middle temporal gyrus (19)</i>	R		24	-82	18	6.58
	<i>Middle temporal gyrus (18)</i>	L		-22	-92	12	6.11
	<i>Inferior temporal gyrus (19)</i>	R		34	-82	4	6.03
	<i>Precuneus (7)</i>	R		4	-70	56	5.72
	<i>Cuneus (17)</i>	L		-12	-90	14	5.67
	<i>Middle occipital gyrus (18)</i>	L		-18	-90	14	5.66
	<i>Precuneus (7)</i>	L		-8	-56	44	5.62
	<i>Cuneus (17)</i>	L		-14	-96	10	5.59
	<i>Cuneus (17)</i>	L		-10	-90	10	5.59
	<i>Cuneus (17)</i>	L		-18	-92	4	5.36
	<i>Lingual gyrus (18)</i>	L		-6	-82	6	5.16
	<i>Lingual gyrus (18)</i>	L		-12	-76	2	5.09
	<i>Cuneus (19)</i>	R		6	-86	36	4.99
VOL>WPHF	<i>Cuneus (17)</i>	L	12415	-14	-98	10	7.1
	<i>Lingual gyrus (18)</i>	R		18	-90	0	6.54
	<i>Cerebellum</i>	R		0	-86	-16	6.5
	<i>Cuneus (17)</i>	R		10	-92	6	6.36
	<i>Middle temporal gyrus (18)</i>	L		-22	-92	12	5.91
	<i>Posterior cerebellum</i>	R		22	-78	-14	5.83
	<i>Inferior occipital gyrus (18)</i>	R		32	-78	0	5.82
	<i>Posterior cerebellum</i>	L		-24	-72	-16	5.65
	<i>Lingual gyrus (18)</i>	L		-12	-86	-10	5.48
	<i>Posterior cerebellum</i>	L		-22	-64	-16	5.46
	<i>Precuneus (7)</i>	R		2	-70	56	5.34
	<i>Anterior cerebellum</i>	R		6	-70	-8	5.33
	<i>Middle temporal gyrus (18)</i>	R		22	-90	8	5.31
	<i>Lingual gyrus (18)</i>	L		-8	-92	-4	5.22
	<i>Cuneus (19)</i>	R		4	-86	38	5.18
	<i>Anterior cerebellum</i>	L		-2	-66	-4	5.16
CONV>VOL	<i>Caudate nucleus</i>	L	645	-10	6	14	5.86
	<i>Thalamus</i>	R		0	-6	2	5.47
	<i>Caudate nucleus</i>	R		6	-2	14	4.34
	<i>Caudate nucleus</i>	R		10	4	16	4.29
	<i>Caudate nucleus</i>	R		18	6	16	4.02
	<i>Caudate nucleus</i>	R		20	-2	14	3.4
	<i>Putamen</i>	R		26	4	10	3.05
	<i>Putamen</i>	R		26	0	8	2.81
	<i>Putamen</i>	R		24	-6	12	2.8