

## *Supplementary Material*

**Supplementary Table 1.** Training information

	Training amount during 6wks (min)			Training Movement				
	Number of training sessions	Total training time, min	Mean training time per session, min	Forearm pron/sup (%)	Wrist UD/RD (%)	Wrist UD/RD-EG (%)	Wrist Flex/Ext (%)	Wrist Flex/Ext-EG (%)
Subject01	41	1368	33.4	13.4	10.8	7.5	27.9	40.3
Subject02	37	1175	31.8	13.3	12.3	11.1	25.6	37.6
Subject03	33	990	30.0	12.1	9.8	8.0	37.8	32.3
Subject04	29	978	33.7	15.8	8.6	8.4	31.0	36.2
Subject05	31	973	31.4	15.8	9.5	9.8	31.1	33.8
Subject06	31	930	30.0	12.5	9.7	12.1	23.8	41.9
Subject07	29	884	30.5	16.6	13.8	7.0	23.9	38.7
Subject08	27	863	32.0	8.6	13.1	10.8	30.0	37.6
Subject09	35	850	24.3	15.0	7.8	10.9	25.1	41.1
Subject10	27	803	29.7	12.6	10.1	9.3	34.0	34.0
Subject11	24	744	31.0	16.5	4.6	3.4	64.0	11.5
Subject12	33	679	20.6	17.1	9.4	8.8	30.7	35.0
Subject13	30	627	20.9	30.1	13.1	12.7	23.8	20.3
Subject14	28	618	22.1	24.0	6.3	12.3	21.6	35.8
Subject15	12	337	28.1	18.6	5.5	9.9	34.0	32.0
Mean (1-15)	29.8 (6.5)	854.6 (245.2)	28.6 (4.4)	16.0 (5.2)	9.7 (2.8)	9.5 (2.4)	30.7 (9.7)	33.9 (8.1)
Excluded from analysis								
Subject16	5	112	22.5	14.8	3.4	2.7	33.3	45.9
Subject17	5	87	17.4	34.1	11.5	4.8	24.9	24.9

UD, ulnar deviation; RD, radial deviation; EG, eliminated gravity

**Supplementary Table 2.** Motion analysis at baseline, after intervention, and at 6 weeks follow-up

Variable	Task phase	Group	T0	T1	T2	Mann-Whitney test			Friedman Test	Wilcoxon signed rank test	
						T0	$\Delta$ T0-T1	$\Delta$ T0-T2	T0-T2	T0-T1	T0-T2
						mean (SD)	mean (SD)	mean (SD)	P	P	P
<b>Temporal-spatial Parameter</b>											
Movement Time	Phase 1	VR	1.46 (0.59)	1.38 (0.56)	1.64 (0.75)	0.382	0.908	0.908	0.819	0.733	0.532
		Control	1.37 (0.68)	1.34 (0.69)	1.55 (0.96)						
	Phase 2	VR	1.97 (1.24)	1.97 (1.21)	1.52 (0.84)	0.934	0.961	0.019*	0.138	0.510	0.061
		Control	1.72 (0.80)	1.89 (1.29)	1.98 (1.13)						
	Phase 3	VR	1.64 (0.83)	1.57 (0.67)	1.46 (0.86)	0.934	0.705	0.214	0.247	0.733	0.307
		Control	1.73 (1.11)	1.66 (1.30)	1.91 (1.83)						
	Phase 4	VR	1.28 (0.58)	1.49 (0.50)	1.70 (0.93)	0.382	0.382	0.438	0.280	0.047	0.078
		Control	1.59 (0.85)	1.66 (1.22)	1.61 (0.70)						
Index of Curvature	Phase 1	VR	1.42 (0.30)	1.49 (0.43)	1.34 (0.65)	0.633	0.657	>0.999	0.627	0.776	0.865
		Control	1.40 (0.36)	1.34 (0.22)	1.43 (0.35)						
	Phase 2	VR	1.26 (0.21)	1.26 (0.32)	1.11 (0.58)	0.107	0.080	0.542	0.807	0.638	0.427
		Control	1.18 (0.24)	1.21 (0.30)	1.16 (0.10)						
	Phase 3	VR	1.30 (0.32)	1.20 (0.10)	1.24 (0.97)	0.587	0.856	0.755	0.420	0.820	0.334
		Control	1.33 (0.53)	1.23 (0.34)	1.20 (0.24)						
	Phase 4	VR	1.52 (0.63)	1.49 (0.37)	1.65 (1.13)	0.856	0.831	0.542	0.189	0.733	0.570
		Control	1.61 (0.81)	1.53 (0.47)	1.58 (0.47)						

VR, virtual reality; Values are Least square mean (standard error)

\* p &lt;0.05 by linear mixed model



**Supplementary Figure 1.** Segmentation of motion capture data of the reach-and-grasp task