

**Table S2.** Raw statistics of the Healthy and Pathological Group.

Group Statistics					
	State	N	Mean	Std. Deviation	Std. Error Mean
Flexion-Extension (Frontal axis) total length (°)	Healthy	75	104.6099071409	25.15439792946	2.90457968317
	Pathological	75	87.2123917451	24.98525195654	2.88504838858
Flexion-Extension (Frontal axis) angular velocity (°/s)	Healthy	75	42.01754850973	11.838397370221	1.366980381694
	Pathological	75	35.75737557088	14.566584623693	1.682004310733
Flexion-Extension (Frontal axis) max range (°)	Healthy	75	83.9940422404	16.27895200765	1.87973146475
	Pathological	75	71.6035092065	17.85171657143	2.06133867360
Flexion-Extension (Frontal axis) max value (°)	Healthy	75	62.1324809656	10.75174521944	1.24150459934
	Pathological	75	55.5320776380	14.23631007345	1.64386749063
Flexion-Extension (Frontal axis) min value (°)	Healthy	75	-22.56532880041	11.029395245058	1.273564862747
	Pathological	75	-16.07143156759	7.947855977797	.917739357652
Flexion-Extension (Frontal axis) max speed (°/s)	Healthy	75	117.4639676831	33.31579127239	3.84697621188
	Pathological	75	91.5928370787	37.11871218411	4.28609969429
Flexion-Extension (Frontal axis) min speed (°/s)	Healthy	75	-92.2110028783	28.91931819524	3.33931522896
	Pathological	75	-84.0193387055	30.98899760357	3.57830122167
Flexion-Extension (Frontal axis) Speed Harmony (°/s)	Healthy	75	-.55034578191	.134103919083	.015484986756
	Pathological	75	-.59204414396	.143123430425	.016526470217
Rotation (Longitudinal axis) total length (°)	Healthy	75	98.8218647033	18.86494160786	2.17833582311

	Pathologica l	75	87.4840263227	23.5967980147 3	2.72472353716
Rotation (Longitudinal axis) angular velocity (°/s)	Healthy	75	45.1473483475	12.1250952090 9	1.40008539658
	Pathologica l	75	38.0959401820	15.1007953820 0	1.74368965575
Rotation (Longitudinal axis) max range (°)	Healthy	75	78.7188782581	12.5042235919 5	1.44386337136
	Pathologica l	75	69.3969534108	15.5140072686 9	1.79140325456
Rotation (Longitudinal axis) max value (°)	Healthy	75	38.5115326231	6.76018816307	.78059929114
	Pathologica l	75	34.3978137489	8.48850029151	.98016758566
Rotation (Longitudinal axis) min value (°)	Healthy	75	-40.2073456361	6.70814814281	.77459022720
	Pathologica l	75	-34.9991396620	7.70283269705	.88944650623
Rotation (Longitudinal axis) max speed (°/s)	Healthy	75	96.7213783133	25.1477708781 5	2.90381445720
	Pathologica l	75	83.3823404319	30.6342699625 1	3.53734080186
Rotation (Longitudinal axis) min speed (°/s)	Healthy	75	-95.9354483597	23.4447702192 1	2.70716887943
	Pathologica l	75	-81.6118858641	29.6099376848 9	3.41906109861
Rotation (Longitudinal axis) speed harmony (°/s)	Healthy	75	-.59877726432	.138512142401	.015994004540
	Pathologica l	75	-.57702491489	.139813361347	.016144256362
Laterization (Sagittal axis) Total Length (°)	Healthy	75	98.6878282457	17.4901680519 0	2.01959064659
	Pathologica l	75	77.9673070824	23.9347598778 0	2.76374801169
Laterization (Sagittal axis) angular velocity (°/s)	Healthy	75	42.1049414260 0	9.89484543914 6	1.142558335576
	Pathologica l	75	33.6656308828 5	13.6929787358 97	1.581128991836
Laterization (Sagittal axis) max range (°)	Healthy	75	77.0943477249	12.4906836132 4	1.44229990929
	Pathologica l	75	61.7832643621	16.0226892745 1	1.85014079316

Laterization (Sagittal axis)	Healthy	75	40.0710514899	6.77079003664	.78182349006
max value (°)	Pathologica l	75	31.8352556375	8.15858808119	.94207260498
Laterization (Sagittal axis)	Healthy	75	- 37.0232962338 7	6.52419548588 1	.753349204004
min value (°)	Pathologica l	75	- 29.9480087247 9	8.45371527232 0	.976150957625
Laterization (Sagittal axis)	Healthy	75	79.7717408824	19.8586827367 8	2.29308316477
max speed (°/s)	Pathologica l	75	64.0221178512	25.7235354717 8	2.97029802583
Laterization (Sagittal axis)	Healthy	75	-80.7410002301	20.1645980642 9	2.32840722410
min speed (°/s)	Pathologica l	75	-65.3123756316	24.4778650159 4	2.82646039123
Laterization (Sagittal axis)	Healthy	75	-.65644624315	.151417357877	.017484170466
speed harmony (°/s)	Pathologica l	75	-.67780276156	.143678263342	.016590536803

**Table S3.** Independent Sample Test from both groups.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2- tailed)	Mean Differe nce	Std. Error Differe nce	95% Confidence Interval of the Difference	
									Lower	Upper
Flexion- Extension (Frontal axis)	Equal variances assumed	.044	.834	4.25 0	148	.000	17.3975 153958 7	4.09390 856521	9.30745 059335	25.4875 801983 8
	Equal variances not assumed			4.25 0	147. 993	.000	17.3975 153958 7	4.09390 856521	9.30744 755777	25.4875 832339 7
Flexion- Extension (Frontal axis)	Equal variances assumed	2.130	.147	2.88 8	148	.004	6.26017 293885 3	2.16743 485836 6	1.97705 616179 5	10.5432 897159 12
	Equal variances not assumed			2.88 8	142. 061	.004	6.26017 293885 3	2.16743 485836 6	1.97557 977929 0	10.5447 660984 17
Flexion- Extension (Frontal axis)	Equal variances assumed	.181	.671	4.44 2	148	.000	12.3905 330338 7	2.78971 459236	6.87771 527713	17.9033 507906 0
	Equal variances not assumed			4.44 2	146. 759	.000	12.3905 330338 7	2.78971 459236	6.87733 091734	17.9037 351504 0
Flexion- Extension (Frontal axis)	Equal variances assumed	3.926	.049	3.20 4	148	.002	6.60040 332760	2.06000 825167	2.52957 468445	10.6712 319707 5
	Equal variances not assumed			3.20 4	137. 694	.002	6.60040 332760	2.06000 825167	2.52706 171194	10.6737 449432 6

Flexion- Extension (Frontal axis) min value (°)	Equal variances assumed	9.142	.003	- 4.13 7	148	.000	- 6.49389 723282 7	1.56978 119118 8	- 9.59597 715478 4	- 3.39181 731086 9
	Equal variances not assumed			- 4.13 7	134. 531	.000	- 6.49389 723282 7	1.56978 119118 8	- 9.59853 931175 8	- 3.38925 515389 6
Flexion- Extension (Frontal axis) max speed (°/s)	Equal variances assumed	2.160	.144	4.49 2	148	.000	25.8711 306044 0	5.75932 952384	14.4899 899842 1	37.2522 712245 9
	Equal variances not assumed			4.49 2	146. 304	.000	25.8711 306044 0	5.75932 952384	14.4889 023047 1	37.2533 589040 9
Flexion- Extension (Frontal axis) min speed (°/s)	Equal variances assumed	2.258	.135	- 1.67 4	148	.096	- 8.19166 417280	4.89441 169410	- 17.8636 212145 2	1.48029 286892
	Equal variances not assumed			- 1.67 4	147. 298	.096	- 8.19166 417280	4.89441 169410	- 17.8640 009369 1	1.48067 259131
Flexion- Extension (Frontal axis) Speed Harmony (°/s)	Equal variances assumed	.332	.566	1.84 1	148	.068	.041698 362053	.022647 495064	- .003055 862366	.086452 586473
	Equal variances not assumed			1.84 1	147. 377	.068	.041698 362053	.022647 495064	- .003057 421068	.086454 145175
Rotation (Longitudinal axis) total length (°)	Equal variances assumed	3.872	.051	3.25 0	148	.001	11.3378 383806 7	3.48844 740712	4.44423 899168	18.2314 377696 5
	Equal variances not assumed			3.25 0	141. 159	.001	11.3378 383806 7	3.48844 740712	4.44148 411352	18.2341 926478 1

Rotation (Longitudinal axis) angular velocity (°/s)	Equal variances assumed	4.658	.033	3.15 3	148	.002	7.05140 816547	2.23622 287201	2.63235 784735	11.4704 584835 8
	Equal variances not assumed			3.15 3	141. 402	.002	7.05140 816547	2.23622 287201	2.63065 752515	11.4721 588057 9
Rotation (Longitudinal axis) max range (°)	Equal variances assumed	1.777	.185	4.05 2	148	.000	9.32192 484733	2.30084 051068	4.77518 215995	13.8686 675347 1
	Equal variances not assumed			4.05 2	141. 612	.000	9.32192 484733	2.30084 051068	4.77349 085873	13.8703 588359 3
Rotation (Longitudinal axis) max value (°)	Equal variances assumed	4.943	.028	3.28 3	148	.001	4.11371 887413	1.25302 184710	1.63759 421708	6.58984 353119
	Equal variances not assumed			3.28 3	140. 940	.001	4.11371 887413	1.25302 184710	1.63657 144383	6.59086 630443
Rotation (Longitudinal axis) min value (°)	Equal variances assumed	.124	.726	- 4.41 6	148	.000	- 5.20820 597413	1.17945 118913	- 7.53894 599908	- 2.87746 594918
	Equal variances not assumed			- 4.41 6	145. 258	.000	- 5.20820 597413	1.17945 118913	- 7.53930 870499	- 2.87710 324328
Rotation (Longitudinal axis) max speed (°/s)	Equal variances assumed	3.794	.053	2.91 5	148	.004	13.3390 378814 7	4.57656 184819	4.29519 106984	22.3828 846930 9
	Equal variances not assumed			2.91 5	142. 588	.004	13.3390 378814 7	4.57656 184819	4.29236 055848	22.3857 152044 6
Rotation (Longitudinal axis) min speed (°/s)	Equal variances assumed	5.912	.016	- 3.28 4	148	.001	- 14.3235 624956 0	4.36104 828428	- 22.9415 281058 9	- 5.70559 688531

	Equal variances not assumed			- 3.28 4	140. 606	.001	- 14.3235 624956 0	4.36104 828428	- 22.9452 650758 4	- 5.70185 991536
Rotation (Longitudinal axis) speed harmony (°/s)	Equal variances assumed	.142	.707	-.957	148	.340	- .021752 349427	.022725 430573	- .066660 583959	.023155 885105
	Equal variances not assumed			-.957	147. 987	.340	- .021752 349427	.022725 430573	- .066660 616321	.023155 917468
Laterization (Sagittal axis) Total Length (°)	Equal variances assumed	4.513	.035	6.05 3	148	.000	20.7205 211633 3	3.42301 759445	13.9562 190989 1	27.4848 232277 5
	Equal variances not assumed			6.05 3	135. 495	.000	20.7205 211633 3	3.42301 759445	13.9510 694144 3	27.4899 729122 4
Laterization (Sagittal axis) angular velocity (°/s)	Equal variances assumed	3.225	.075	4.32 6	148	.000	8.43931 054314 7	1.95074 561104 7	4.58439 826184 0	12.2942 228244 53
	Equal variances not assumed			4.32 6	134. 725	.000	8.43931 054314 7	1.95074 561104 7	4.58126 476129 7	12.2973 563249 97
Laterization (Sagittal axis) max range (°)	Equal variances assumed	1.471	.227	6.52 7	148	.000	15.3110 833628 0	2.34590 067625	10.6752 962686 7	19.9468 704569 3
	Equal variances not assumed			6.52 7	139. 684	.000	15.3110 833628 0	2.34590 067625	10.6730 201750 6	19.9491 465505 4
Laterization (Sagittal axis) max value (°)	Equal variances assumed	.668	.415	6.72 7	148	.000	8.23579 585240	1.22423 394931	5.81655 960772	10.6550 320970 8
	Equal variances not assumed			6.72 7	143. 137	.000	8.23579 585240	1.22423 394931	5.81588 191585	10.6557 097889 5

Laterization (Sagittal axis) min value (°)	Equal variances assumed	1.884	.172	- 5.73 8	148	.000	- 7.07528 750908 0	1.23304 732887 5	- 9.51194 007136 0	- 4.63863 494680 0
	Equal variances not assumed			- 5.73 8	139. 067	.000	- 7.07528 750908 0	1.23304 732887 5	- 9.51323 086602 5	- 4.63734 415213 5
Laterization (Sagittal axis) max speed (°/s)	Equal variances assumed	2.423	.122	4.19 7	148	.000	15.7496 230312 0	3.75245 263298	8.33431 697695	23.1649 290854 5
	Equal variances not assumed			4.19 7	139. 087	.000	15.7496 230312 0	3.75245 263298	8.33039 816527	23.1688 478971 3
Laterization (Sagittal axis) min speed (°/s)	Equal variances assumed	.865	.354	- 4.21 3	148	.000	- 15.4286 245985 3	3.66201 563957	- 22.6652 160758 5	- 8.19203 312122
	Equal variances not assumed			- 4.21 3	142. 767	.000	- 15.4286 245985 3	3.66201 563957	- 22.6674 030684 3	- 8.18984 612864
Laterization (Sagittal axis) speed harmony (°/s)	Equal variances assumed	1.300	.256	.886	148	.377	.021356 518413	.024102 741095	- .026273 450423	.068986 487250
	Equal variances not assumed			.886	147. 595	.377	.021356 518413	.024102 741095	- .026274 529089	.068987 565915



**Table S4.** Independent Samples Effect Sizes

Independent Samples Effect Sizes					
		Standardizer <sup>a</sup>	Point Estimate	95% Confidence Interval	
				Lower	Upper
Flexion-Extension (Frontal axis) total length (°)	Cohen's d	25.0699675959 6	.694	.363	1.023
	Hedges' correction	25.1979119076 2	.690	.361	1.017
	Glass's delta	24.9852519565 4	.696	.355	1.033
Flexion-Extension (Frontal axis) angular velocity (°/s)	Cohen's d	13.2727736342 95	.472	.146	.795
	Hedges' correction	13.3405110926 66	.469	.146	.791
	Glass's delta	14.5665846236 93	.430	.101	.756
Flexion-Extension (Frontal axis) max range (°)	Cohen's d	17.0834431982 3	.725	.394	1.055
	Hedges' correction	17.1706283679 8	.722	.392	1.049
	Glass's delta	17.8517165714 3	.694	.353	1.031
Flexion-Extension (Frontal axis) max value (°)	Cohen's d	12.6149227062 9	.523	.197	.848
	Hedges' correction	12.6793028294 8	.521	.196	.844
	Glass's delta	14.2363100734 5	.464	.134	.791
Flexion-Extension (Frontal axis) min value (°)	Cohen's d	9.61290731557 1	-.676	-1.004	-.345
	Hedges' correction	9.66196668530 5	-.672	-.999	-.344
	Glass's delta	7.94785597779 7	-.817	-1.161	-.469
Flexion-Extension (Frontal axis) max speed (°/s)	Cohen's d	35.2685464848 8	.734	.402	1.063

	Hedges' correction	35.44853913488	.730	.400	1.058
	Glass's delta	37.11871218411	.697	.356	1.034
Flexion-Extension (Frontal axis) min speed (°/s)	Cohen's d	29.97202810414	-.273	-.594	.049
	Hedges' correction	30.12499002921	-.272	-.591	.048
	Glass's delta	30.98899760357	-.264	-.586	.059
Flexion-Extension (Frontal axis) Speed Harmony (°/s)	Cohen's d	.138687017147	.301	-.022	.622
	Hedges' correction	.139394804856	.299	-.022	.619
	Glass's delta	.143123430425	.291	-.033	.614
Rotation (Longitudinal axis) total length (°)	Cohen's d	21.36229035492	.531	.204	.856
	Hedges' correction	21.47131257541	.528	.203	.851
	Glass's delta	23.59679801473	.480	.150	.808
Rotation (Longitudinal axis) angular velocity (°/s)	Cohen's d	13.69401246893	.515	.189	.839
	Hedges' correction	13.76389971519	.512	.188	.835
	Glass's delta	15.10079538200	.467	.137	.794
Rotation (Longitudinal axis) max range (°)	Cohen's d	14.08971307675	.662	.332	.989
	Hedges' correction	14.16161977683	.658	.330	.984
	Glass's delta	15.51400726869	.601	.265	.933
Rotation (Longitudinal axis) max value (°)	Cohen's d	7.67316040491	.536	.209	.861
	Hedges' correction	7.71232029702	.533	.208	.857
	Glass's delta	8.48850029151	.485	.154	.812
Rotation (Longitudinal axis) min value (°)	Cohen's d	7.22263397469	-.721	-1.050	-.390
	Hedges' correction	7.25949460998	-.717	-1.045	-.388

	Glass's delta	7.70283269705	-.676	-1.012	-.336
Rotation (Longitudinal axis) max speed (°/s)	Cohen's d	28.02560326091	.476	.151	.800
	Hedges' correction	28.16863162759	.474	.150	.796
	Glass's delta	30.63426996251	.435	.106	.762
Rotation (Longitudinal axis) min speed (°/s)	Cohen's d	26.70585760030	-.536	-.861	-.210
	Hedges' correction	26.84215065910	-.534	-.857	-.209
	Glass's delta	29.60993768489	-.484	-.812	-.153
Rotation (Longitudinal axis) speed harmony (°/s)	Cohen's d	.139164272721	-.156	-.477	.165
	Hedges' correction	.139874496099	-.156	-.474	.164
	Glass's delta	.139813361347	-.156	-.476	.166
Laterization (Sagittal axis) Total Length (°)	Cohen's d	20.96161621741	.988	.648	1.326
	Hedges' correction	21.06859360172	.983	.644	1.320
	Glass's delta	23.93475987780	.866	.514	1.212
Laterization (Sagittal axis) angular velocity (°/s)	Cohen's d	11.945828412595	.706	.375	1.035
	Hedges' correction	12.006793820210	.703	.373	1.030
	Glass's delta	13.692978735897	.616	.279	.949
Laterization (Sagittal axis) max range (°)	Cohen's d	14.36564911018	1.066	.722	1.407
	Hedges' correction	14.43896404686	1.060	.718	1.399
	Glass's delta	16.02268927451	.956	.598	1.308
Laterization (Sagittal axis) max value (°)	Cohen's d	7.49687125402	1.099	.753	1.441
	Hedges' correction	7.53513145633	1.093	.749	1.433
	Glass's delta	8.15858808119	1.009	.648	1.366

Laterization (Sagittal axis) min value (°)	Cohen's d	7.550841961114	-.937	-1.273	-.598
	Hedges' correction	7.589377602353	-.932	-1.266	-.595
	Glass's delta	8.453715272320	-.837	-1.182	-.487
Laterization (Sagittal axis) max speed (°/s)	Cohen's d	22.97898558692	.685	.355	1.014
	Hedges' correction	23.09625859424	.682	.353	1.009
	Glass's delta	25.72353547178	.612	.276	.945
Laterization (Sagittal axis) min speed (°/s)	Cohen's d	22.42517436758	-.688	-1.016	-.357
	Hedges' correction	22.53962100526	-.685	-1.011	-.356
	Glass's delta	24.47786501594	-.630	-.964	-.293
Laterization (Sagittal axis) speed harmony (°/s)	Cohen's d	.147598542716	.145	-.176	.465
	Hedges' correction	.148351810301	.144	-.175	.463
	Glass's delta	.143678263342	.149	-.173	.469

a. The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation, plus a correction factor.

Glass's delta uses the sample standard deviation of the control group.