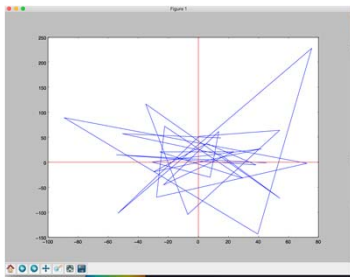


There's an App for That: Reliability of an iPhone App to Assess Upper Extremity Proprioception and Stability

K. Smith, V. Patel, K. Luchan, J Lynch



IOC WORLD CONFERENCE
ON PREVENTION OF INJURY
AND ILLNESS IN SPORT

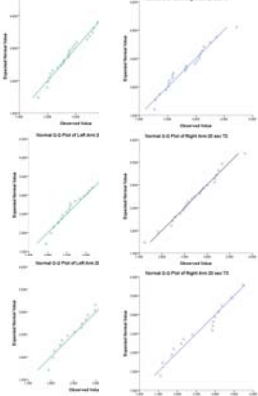


Path Length of one 20 second trial

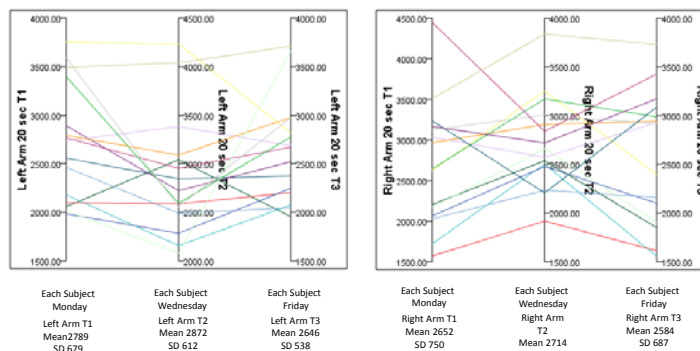
Absolute Reliability

Arm	Path Length			95% Confidence Interval	
	Mean	Std. Error	Lower Bound	Upper Bound	
Left Arm	2744.000	124.000	2479.000	3010.000	
Right Arm	2669.000	149.000	2348.000	2990.000	

Standard Error of the Estimate Mean Square Error



Relative Reliability



Systematic Bias

Paired Samples Test

	Mean	Std. Deviation	Mean	Std. Deviation
Normal	.26	.08	.46	.20
Sk	.67	.64	.62	.60
Skurtosis	1.25	.80	.85	.875
95% Lower	.960	.880	.900	.858
95% Upper	2.00	.880	2.00	.880
df	22		22	
df Total	45		45	

Cronbach's Alpha	
Left Arm	Right Arm
.862	.739
N=3 each	

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	6865286.865	2	3432643.432	30.64	.000 b
Residual	1345977.665	12	112164.805		
Total	8211264.529	14			

a: Dependent Variable: Right Arm 20 sec T1
b: Predictors: (Constant), Right Arm 20 sec T3, Right Arm 20 sec T2

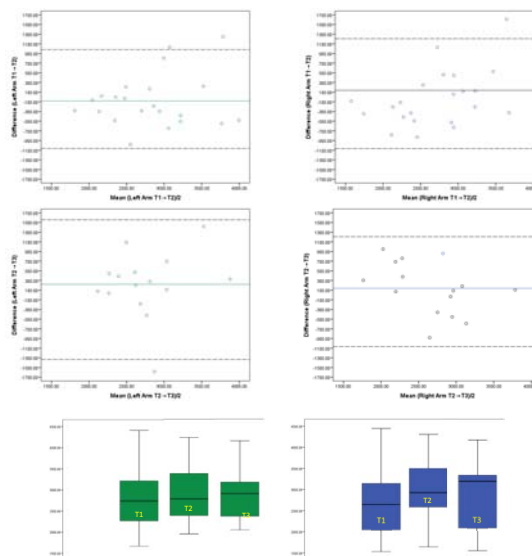
Coefficient of Variation Test 1 to Test 2

Subject	Left Arm	Right Arm
1	.10	.13
2	.15	.13
3	.11	.14
4	.10	.06
5	.06	.11
6	.02	.07
7	.09	.15
8	.23	.11
9	.08	.05
10	.11	.14
11	.11	.06
12	.01	.26
13	.24	.03
14	.01	.07
15	.05	.03
16	.27	.20
17	.05	.05
18	.07	.01
19	.16	.12
20	.08	.27
21	.02	.14
22	.05	.13

Mauchly's Test of Sphericity ^a				
Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.
Arm	1.800	6.000	0	1.000
Tests	0.894	1.452	2	0.484
Arm * Tests	0.909	1.240	2	0.538

Tests the null hypothesis that the error covariance matrix of the ortnonormalized transformed dependent variables is proportional to an identity matrix.
a. Design: Intercept
Within Subjects Design: Arm * Tests * Arm * Tests
b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Bland Altman plots of mean difference



Minimal Detectable Difference (MDD 95%)	
1.96 x SEM x sqrt(2)	
Left	1.96 x 124 x sqrt(2) = 344
Right	1.96 x 149 x sqrt(2) = 413

IBM SPSS Statistics version 24.0
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Weissgerber TL, Milić NM, Winham SJ et al. Beyond bar and line graphs: time for a new data presentation paradigm. *PLOS Biology* 2015;13(4):e1002128.
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