DEVELOPEMENT OF AN INSTRUMENT TO MEASURE THE "QUASI-STATIC" SENSE OF BALANCE

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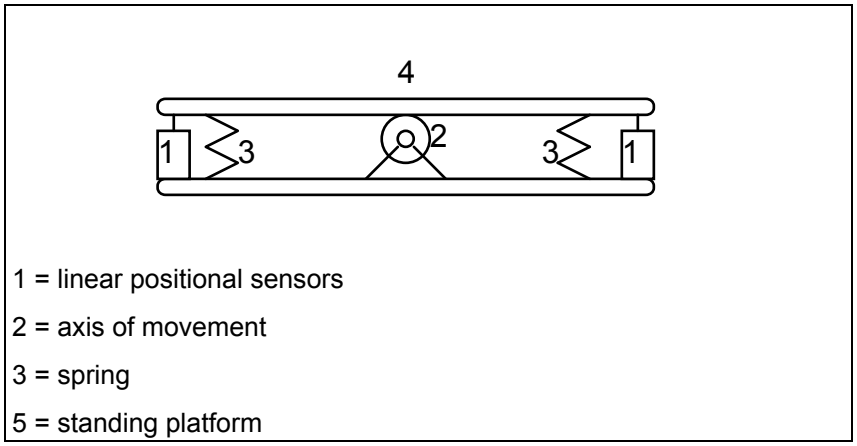
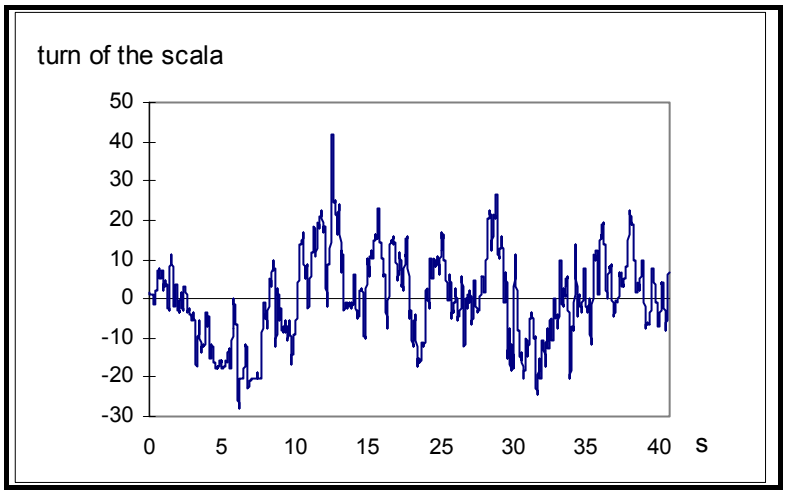
INTRODUCTION: A measuring instrument was developed which records the oscillation of the body in standing with regard to the projection of the center of gravity. The measuring instrument works like a seesaw, the axis of movement running below the platform (40*40 cm²). Variations are recorded by two linear positional sensors placed under the edge of the construction. The platform rotates up to 6°, swaying is muffled by springs. The springs could be varied to the motor ability of users. In this study springs were used which stabilize 5 kg.



Model of a "quasi-static" sense of balance

METHODS: In the study the mentioned construction was compared to the Kistler force platform. This device was also used to record the projection of the body's center of gravity onto the ground. 19 subjects took part in the test, which consisted of standing with closed eyes on one foot with five repetitions of 40 seconds, each time trying to maintain one's balance. The test was repeated one week later. Different measuring instruments with different parameters were compared. These were among others: mean variation of measurements, average of the mean, the length of the curve of the projection and the greatest divergence from the mean. Based on the date of the positional sensors, which was divided through the body weight, the projection of the cm was calculated. This date in time formed the curve.



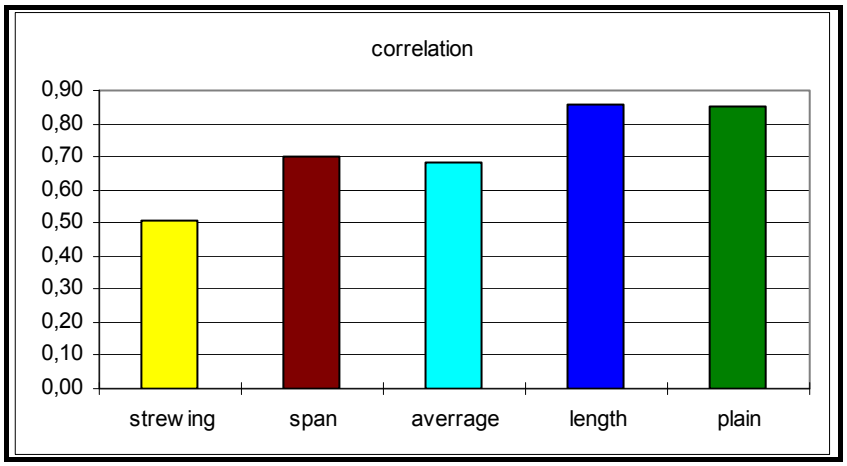
Example of a curve of the projection of the cm

RESULTS: It turned out that each parameter states a different aspect of the motor quality "quasi-static balance". The degree of definiteness among parameters of one measuring instrument differed between 0% and 98%.

Parameters	strewing	span	average	length	plain
Strewing	100 %	77 %	51 %	41 %	2 %
Span	77 %	100 %	86 %	36 %	0 %
Average	51 %	86 %	100 %	18 %	2 %
Length	41 %	36 %	18 %	100 %	0 %
Flain	2 %	0 %	2 %	0 %	100 %

Degree of definiteness

A significant correlation ($p < .05$) between parameters of both measuring instruments was deleted in two cases. The parameters were length of the curve and the average of the mean. Retest reliability was highly significant ($p < .01$) in almost all parameters.



Reliability of the parameters

parameters	correlation
strewing	0.505*
span	0.699**
average	0.675**
length	0.477*
plain	0.85**

Test-Retest correlation

The tests provide reliability, validity and objectivity. Furthermore, the constructed measuring instrument stands out due to its mass of only 5kg; thus it can be easily moved.

CONCLUSION: This study shows that the developed measuring instrument is an alternative measuring system to the Kistler force platform for measuring quasi-static balance in one axis.