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Titel
Spiegelt der SHAP die Menge der Kompensationsbewegungen bei Aktivitäten der oberen Extremitäten wider?

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Zusammenfassung

Einführung
The Southampton Assessment Procedure (SHAP) is a commonly used application to assess the function of normal or impaired hands or the performance of hand prostheses. It is a time-based test which no assessment of the quality of movements. Fast performance, in that case, does not indicate good quality of movement. Because of non-transparencies in the calculation of the SHAP score (Index of Function, IOF) and predefined normative data (GL), Burgerhof et al. suggest an alternative scoring system (Linear Index of Function, LIF [2]). In 3D motion analysis, the APS is also a commonly used value to measure the function of upper limbs. The APS based on 3D kinematics is a summary index estimated to normative movement patterns. A high APS indicates more compensatory movements [3]. This work will clarify the connection of the LIF and the APS and the question if the SHAP is appropriate to assess hand functions.

Methodik
19 subjects are randomly separated into two groups (11 self-captured normative (age: 31±7.6 years) - G1 and 10 able-bodied participants (age: 30±8.4 years) - G2: 8 left, 9 right handed). They perform all 26 items with one repetition and both sides following the guidelines of the SHAP. If participants execute a task badly, it will be repeated once. If the test is not evidently performed, it will be excluded. Performance of the tasks has to be as fast and precisely as possible. The time of each item is calculated as LIF including G1. The LIF is directly linear transformed of the observed time and is scaled from 0 (poor) to 100 (excellent). 3D kinematics is simultaneously captured with Vicon Nexus 2.6. The APS [3] is estimated as a summary
index of movement patterns compared to normative subjects. The Spearman Rank correlation is applied on these non-normally distributed parameters. It is hypothesised that there is no correlation between the APS and the LIF.

**Ergebnisse**
Figure 1 represents the median times of 8 able-bodied subjects (G2) for the left side while page turning and rotate key task [1]. The grey bands in Figure 1a and 1c show mean times ± standard deviation of the self-captured normative group (G2). The red line represents the average time of the normative group (GL) of Light et al.[1]. The black lines in 1b and 1d describe the mean APS of the self-captured normative group in Figure 1b and d. G1 (able-bodied subjects) nearly provides the same mean execution time compared to GL. Figure 1a shows two outliers in execution time. The maximum value of APS (1b) is about 20° and the minimum about 7°. Figure 1d shows short execution times with no outliers. Figure 1b represents maximum APS of about 13° and minimum of 7°. The results indicate no significant correlation of the LIF and the APS (p = .127).

**Schlußfolgerung**
The mean time of GL differs to G1 mean time in Figure 2a, but we found no deviation in performance considering the guidelines of the SHAP. A reason could be the age of the normative subjects of G1 which includes participants from 21 to 49 years. In the study of Light et al. [1] the normative group ranges from 18 to 25 years.

In conclusion, no significant correlation was found by clarifying the connection of the APS and the LIF. These figures are impressive to this result because Figure 1a and b indicate high variability and high APS values and c and d represent small APS values and lower variability. Although both items mainly indicate low variability in time, they show different APS results. The page turning task is additionally less guided and allows more variability in execution as the rotate key task. However, based on all items, it is supposed that the clinical SHAP is not evident to assess the quality of movements.
Literaturreferenzen


Image: lif_aps_2107.png