dig-TEMA

FULL DIGITIZATION OF A MOTOR ASSESSMENT

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PROBLEM

Most motor assessments evaluating manual performance are:

| Criterion-based evaluation of qualitative data	EITHER speed OR accuracy (non-IT capture)	Criterion-based evaluation of quantitative data	Performance is not captured digitally
OBJECTIVITY COMPROMISED	**SENSITIVITY COMPROMISED**	**RELIABILITY COMPROMISED**	**ACCURACY COMPROMISED**

A SOLUTION

The development of an IT-based, fully digitised multi-dimensional motor assessment, using the Handedness Profile

The HANDEDNESS PROFILE is a standardised and normative assessment used to determine children's handedness in terms of motor skill, ability, hand preference, cooperation between the hands, and crossing of the body midline. The data collected is MULTIDIMENSIONAL and varied (e.g. qualitative vs quantitative, skilled vs unskilled data).

HP HÄNDIGKEITSPROFIL

DEVELOPMENT

dig-TEMA
digital Test Evaluating Motor Actions
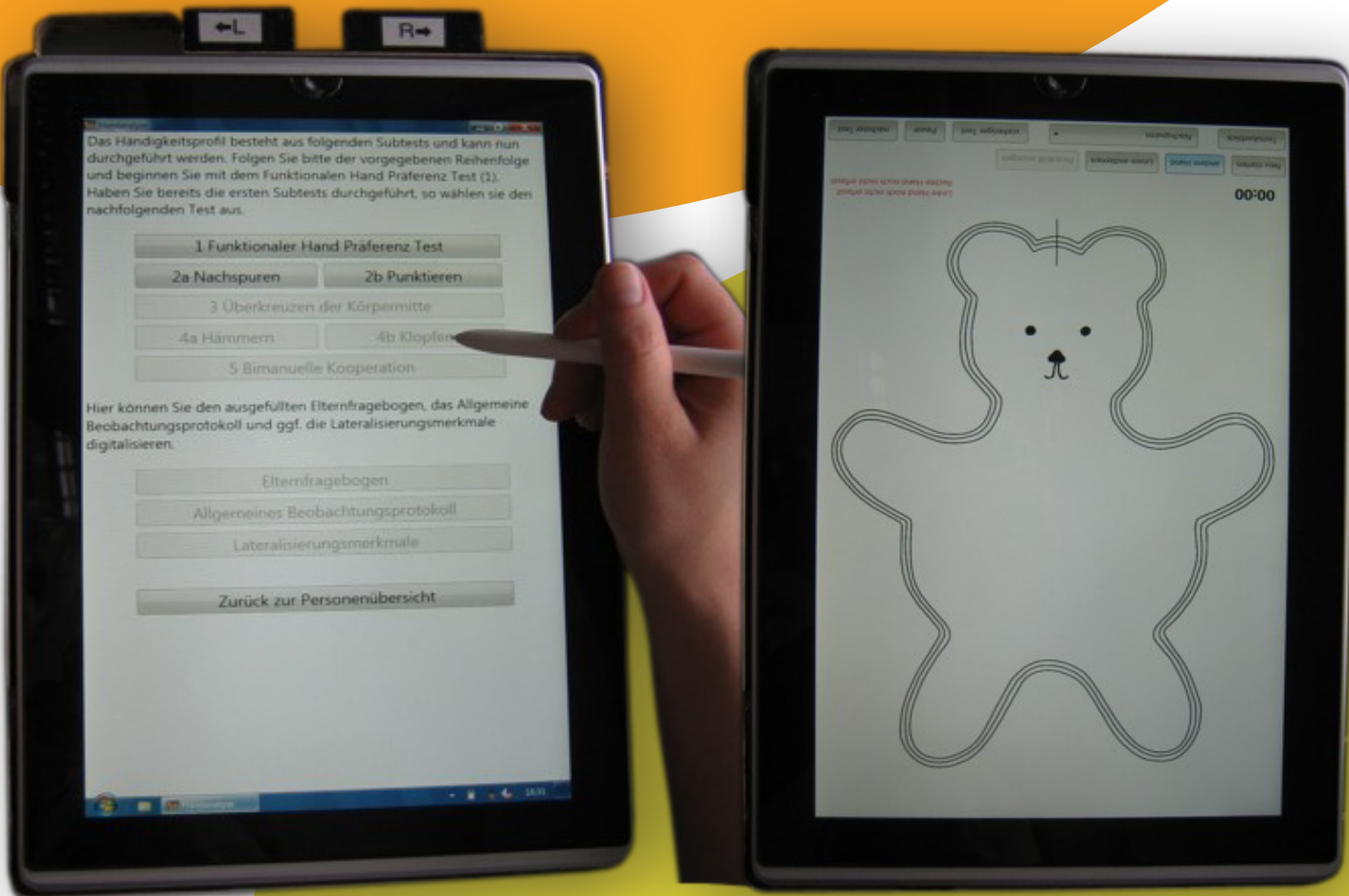
This is an IFAF-sponsored multilateral project led by two Universities of Applied Sciences: the Alice Salomon Hochschule Berlin (ASH) and the Hochschule für Technik und Wirtschaft (HTW). Partners in this project are Tembit, AOK, DVE, and Time Kontor.

The goal of the project is to digitise every subtest of the Handedness Profile, and to use them as basic modules to assess motor actions across age ranges and diagnoses.

RESEARCH

DOMAIN	TEST ITEMS	MULTIDIMENSIONAL CHARACTERISTICS	dig-TEMA DEVELOPMENT
1. Hand Preference	24 everyday tasks, each repeated 4 times	Untrained (unpracticed) and trained (practiced) tasks	Hardware and Software developed
2. Motor Skill	a. Tracing b. Dotting *STUDY I — Computer based tracing task*	Skilled and practiced tasks	Hardware and Software developed. Study I completed
3. Motor Ability	a. Hammering b. Tapping	Skilled and unpracticed tasks	Development in progress
4. Crossing the Body Midline	30 reactions either on left, right or middle, picking up blocks	Ipsilateral (same side) or contralateral (opposite side)	Development in progress
5. Bimanual Cooperation	Bimanual simultaneous circle drawing	4 combinations: inwards, outwards, to left and to right	Development in progress
6. Parent questionnaire	18 questions on aspects of handedness + motor skill	Open ended and closed - qualitative data	Development in progress
7. Laterality & movement quality checklists	30 activites to be observed	Typical of left and right handers - qualitative data	Development in progress
8. Summary of qualitative and quantiative data	A graph and a table summarising all findings	Visual presentation of all qualitative + quantitative data	Development in progress

FINDINGS

RESEARCH DESIGN
In Study I, 6 Therapists were trained on both versions. 25 children (12 normal and 13 with fine motor problems) performed paper and digital tracing tasks. Therapists and children answered a questionnaire, therapists were interviewed.

RESULTS
- The digital version was much more sensitive to mistakes.
- Children without motor problems obtained similar hand differences on both versions.
- Children with motor problems achieved different results on the digital version, presumably because of lack of proprioceptive feedback.

CONCLUSION
The digital version is more sensitive and accurate in capturing the mistakes. However, unimpaired proprioceptive and visual-motor abilities underpinning a tracing task seem necessary for sucessful execution of the digital task. Further studies are required to explore these results. If the findings are confirmed, adjustmens to achieve a more comparable paper-pen experience with the digital version will be necessary.

AOK   Tembit   TimeKontor   DVE