# Computerized Penmanship Evaluation Tool (ComPET) – ID Card

**Rosenblum, Parush & Weiss, 2003**

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| Description | The tool is a computerized system that includes software developed by researchers, an electronic board, and a laptop. The writing is performed using an ink pen like a regular pen - on a sheet of paper placed on the electronic board (digitizer) which captures hand movements in real-time and produces objective measures of time, pressure, and space in the handwriting process. The system is language-independent and can be used to analyze any writing or drawing task. |
| Purpose | To provide objective measures of the handwriting/drawing action. |
| Target population | The system is suitable for anyone who can perform a simple writing task of copying their name or a short sentence, or drawing. It has been used in research with subjects ranging from kindergarten age, through school age, and up to old age, in various health conditions. |
| Administration | The tool is currently used for research purposes and serves researchers in the Laboratory for the Study of Complex Human Activity and Participation.<br>You can contact us regarding collaborations. |
| Versions | Hebrew, Arabic, English |
| Duration for filling out and coding | According to the length of the writing task. |
| Structure | The system includes: an electronic board, a pressure-sensitive electronic pen, and operating software. To use the system, connect the electronic board to a computer with the dedicated operating software installed. Then, place the task sheet on the electronic board and have the subject sit comfortably in front of the table. The task is performed using the electronic pen, and upon completion of the task, the collected data can be coded. There is one software for collecting the writing data and another software for analyzing this data. |
| Scoring | The electronic board samples the pen's position in space at a frequency of 100 or 200 Hz, thus obtaining time and space data. Inside the pen are sensors that are sensitive to the pressure the pen applies to the writing surface, thus obtaining pressure data in non-scaled units. There is a reference to a "writing stroke" defined from the moment the pen touches the page until it leaves the page.<br>The distinction between the time of writing on the surface and the time the pen is in the air allows understanding of the person's function both at the performance level and at the action planning level. "Airtime" is the time during which planning is done before execution, so when we see prolonged time, it can be inferred that there is complexity in planning or initiating the next step. |

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| | Spatial measures indicate the writing product and allow us to see if they are within normal ranges, reduced, or enlarged. The pressure applied to the pen indicates the ability to regulate the grip. The azimuth and tilt of the pen describe the range of motion of the pen during writing. The number of strokes should correspond to the number of letter parts written, if it is much higher, it indicates repetitive writing, erasures, and corrections during writing. |
| Interpretation | A higher average score indicates better performance. A score between 1 and 3.42 indicates a suspicion of developmental coordination disorder. |
| Psychometric indices | Internal reliability was found to be high, as well as convergent validity tested by two similar tasks both performed on the electronic board regarding "airtime" and pen pressure. The findings were also examined with reference to different groups of children and discriminative validity was found. More than 40 peer reviewed publications exhibited the system's benefits. |
| Selected publications | 1. Rosenblum S, Parush S, Weiss PL. (2003). Computerized temporal handwriting characteristics of proficient and poor hand writers. Am J Occup Ther, 57(2),129–38.<br>2. Rosenblum, S. (2012). A Computerised Multidimensional Measurement of Mental Workload via Handwriting. Behaviour Research Methods, 44, 575-586.<br>3. Rosenblum, S., & Luria, G. (2015). Applying a Handwriting Measurement Model for Capturing Cognitive Load Implications Through Complex Figure Drawing. Cognitive Computation, 1-9.<br>4. Fogel, Y., Josman, N., & Rosenblum, S. (2019). Functional abilities as reflected through temporal handwriting measures among adolescents with neuro-developmental disabilities. Pattern Recognition Letters, 121, 13-18.<br>5. Rosenblum, S., Meyer, S., Richardson, A., & Hassin Baer, S. (2022). Patients self-report and handwriting performance features as indicators for suspected Mild cognitive Impairment (MCI) in Parkinson's disease (PD). Sensors, 22, 569. https://doi.org/10.3390/s22020569]. |

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