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Intertwining Graphonomics with Human Movements

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Intertwining Graphonomics with Human Movements

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Réjean Plamondon

In this study, we examine the differences between two Sigma-Lognormal extractors. Script Studio is used to extract the Sigma-Lognormal parameters based on the velocity, and iDeLog is used for extracting the parameters based on both the velocity and the trajectory. The iDeLog software is tested with and without smoothing the data. Handwriting data are used to compare both types of extractor. They consist of triangles drawn on a Wacom Cintiq 13HD by healthy children aged between six and thirteen years old. Global-ly, Script Studio Extract the data with the best SNR for the trajectory (SNR_t) and the velocity (SNR_v). Moreover, it used slightly more lognormals for the reconstruction than iDeLog with smoothing, and nearly half of the number of lognormals used in iDeLog without smoothing. Finally, iDeLog without smoothing has a better reconstruction of the velocity and the trajectory than iDeLog with smoothing.

Effects of a graphomotor intervention on the Graphic Skills of children: an analysis with the Sigma-Lognormal model

Ana Rita do Amaral Matias, Filipe Melo, Helena Coradinho, Orlando Fernandes, Guillaume de Broin, Réjean Plamondon

One of the most discussed issues in handwriting is the question of when young children are (or not) ready to begin handwriting instruction. Several studies highlight the importance of early detection of graphomotor difficulties to better assist and remediate them in the first years of formal school. Also, it is necessary to understand how children control handwriting movements and its learning strategies. Using the Sigma Lognormal approach, in this study we aim to study the effects of a graphomotor intervention program, in the Graphic Skills according to lognormal parameters. Sixty-three children attending the last year of pre-school (25 EG; 30 CG) performed the first nine figures of Beery-Buktenica Developmental Test of Visual-Motor Integration (6th edition) (Beery VMI) on a digitizing tablet. To address the issue related with handwriting, forty-seven second graders (20 EG; 21 CG) performed The Concise Assessment method for Children's Handwriting (BHK), in same conditions above mentioned. A follow-up assessment has been performed six months after the end of graphomotor intervention program. All participants benefited from 16 sessions (twice a week) of a graphomotor intervention program, divided in small groups (6-8 children/group). Each session lasted for 30 minutes. In general children who benefited from a graphomotor intervention showed better

fine movement quality improved with better motor control quality and higher movement fluidity. The maintenance of results after six months was more consistent in preschoolers, because the second-year students are still in a process of handwriting automation.

Copilotrace: a platform to process graphomotor tasks for education and graphonomics research

Celine Remi, Jimmy Nagau

Recent works highlight that a graphomotor analysis of the pupil's movements throughout his schooling for a maximum of writing and production situations could contribute to improving the support of the learning of handwriting well beyond the first years of school. However, to our knowledge, there is no tool to date that could constitute a shared and mobilizable help for all teachers from kindergarten to high school for such process. The Web-platform Copi-lotrace was thought to try to answer this problem. After a review and a discussion of the uses of digital technology to assist teacher's practices of evaluation and monitoring of students' graphomotor skills, the architecture, and main functionalities of Copilotrace, which are centered on the contextualized acquisition and analysis of graphomotor tasks, are presented. Then, the main contributions of the use of Copilotrace, that were validated thanks to some research actions initiated in Guadeloupe within the framework of the eMag-Ma project, are detailed.

The Mental Effort Allocated in Handwriting Production among Adolescents with Executive Function Deficits

Yael Fogel, Sara Rosenblum

This study aimed to compare handwriting-product and -process measures between adolescents with executive function deficits (EFD) and controls and predict group membership. In a secondary analysis with 81 adolescents aged 10–18 years (41 characterized with daily function difficulties and EFD by parent-reported Behavioral Rating Inventory of Executive Function), participants copied 2 paragraphs onto a paper affixed to a digitizer for objective handwriting-process measures. Their written products were scored according to the Handwriting Legibility Scale, which assesses global legibility, overall effort to read the script, layout on-page, letter formation, and text alterations. Significant group differences were found in Tasks 1 and 2 (effort, layout) and temporal-process measure (in-air, on-paper time), and Task 2 global legibility, letter formation, and pen-pressure components. Significant