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The process and the product of the Arabic language handwriting A comparative Study among Children with and without DCD (Developmental Coordination Disorder)

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ABSTRACT

The objective of this study was to examine the writing process and product of the writing in Arabic language of children 11-12 years old, who are diagnosed with DCD compared to a normal children of the same age.

Background: Developmental Coordination Disorder (DCD) is a lack of development of the motor coordination that significantly interferes with the child's activities of daily living and academic achievement, which is not caused by an identifiable neurological problem. (American Psychiatric Association, 1994). One of the significant difficulties for children with Developmental Coordination Disorder is handwriting (Cermak & Larkin, 2002).

Handwriting is a complex activity that entails an intricate blend of cognitive, kinesthetic, and perceptual-motor components (Bonny, 1992; Reisman, 1993).

Handwriting is one of the essential tasks, which children need to master at school and in life in general (Cunningham-Amundson, 1992). Writing difficulties encountered in children suffering from DCD have an enormous effect on academic achievement, self- image and self- esteem (Sasson, Nimmo-Smith, & Wing, 1986). Despite the importance of the handwriting difficulties encountered in children with DCD, little attention was devoted to it in the literature. There were no studies that examined writing in the Arabic language. Therefore, such study is required in order to unveil some facts about the writing process and writing product in the Arabic language among children with DCD, and such study may aid clinicians understanding the writing difficulties facing those children and provide them with the appropriate intervention.

Study hypotheses:

1. Differences will be found between the study group and control group in the process of a copying a task and dictation of a task in the Arabic language. These will be evaluated by a computerized system.
2. Differences will be found between the study group and control group in the final product of the copying a task and the dictation of a task in the Arabic language. These will be evaluated by conventional evaluation methods.
3. There will be a correlation between the writing process and the written product on both tasks (copying, dictation) between the two groups.

Method: Sixty-two 11-12 years old native Arabic language speakers participated in this study. Thirty-one children (3 females and 28 males) were evaluated by the researcher and diagnosed with DCD according to the Movement ABC assessment, Battery for children (Henderson & Sugden, 1992) (total impairment score of the MABC is below than 5%).

Two different tools were used to select the DCD sample according to the criteria of the DSM-4 (American Psychiatric Association, 1994); the questionnaire for the gym teacher to complete (Hay, 1992) and a questionnaire for the classroom teacher to identify children who have difficulty with handwriting (Rosenblum, Jessel, Adi-apha, Parush & Weiss, 1997). Thirty-one children with normal development were in the control group (total impairment score is above 15%) that were matched to the study participants by gender, age and language. The children were recruited from regular public schools. They were asked to perform a copying task and a dictation task. The handwriting process of each child was evaluated through a computerized system; which provides information about time, speed, spacing and pressure (Rosenblum, Parush & Weiss, 2003). The end product of each child's handwriting was evaluated by using an abstract of criteria for analyzing a handwriting sample that was adapted for the Arabic language by Dr. Sara Rosenblum. The tool was based on the Hebrew Handwriting Evaluation (HHE) (Erez & Parush, 1999), which enables

evaluation of handwriting characteristics: speed, time, subjective legibility, letter formation and organization in space.

Results: Results have shown significant difference in the writing process measures (copying and dictation) in time measures (Total time, Air time and ground time). In the copying task significant differences were found in the mean (writing) speed and the ground length. Significant differences were found in the characteristics of the writing product among both groups. A strong negative correlation was found between the (writing) process measures and the characteristics of the (writing) product in the time measures and the number of letters per minute in the copying task. Intermediate correlation was found between the number of segments and the spatial organization onto the writing sheet in the dictation task.

Conclusion: This study reinforces the already existing information concerning the differences in the measures of the writing process and the writing product characteristics between children suffering from DCD and typical children. The results also emphasizes the importance of the objective evaluation, which evaluates time measures, spacing and pressure in the writing process, combined with evaluations based on the subjective impression of the global written output.

In conclusion, these findings support the notion that writing difficulty is a major feature among the difficulties observed in children with DCD and is used as major criterion defining school aged children with DCD (Jongmans, Linthorst-Bakkerb, Westenberge, & Smits-Engelsman, 2003). This study is comprehended as the first phase in the process of establishing an evaluation tool aimed to evaluate writing difficulties amongst children suffering from DCD and establishing appropriate intervention programs.