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# Learning to write letters without a pen : a one-case study with a dysgraphic child

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## Résumé

The prevalence of handwriting problems has been estimated to vary between 5% and 33% (Karlsdottir & Stefansson, 2002). These children experience difficulties with the static and the kinematic aspects of handwriting (Roseblum, Weiss & Parush, 2001; 2003). Multisensory learning which combines visual and haptic exploration of letters might be suitable for these children. The benefits of this kind of training has already been demonstrated among normally developed young children. Letter shapes were learnt by using the finger instead of the stylus to draw them (for a comparison in adults see Prattichizzo, Meli & Malvezzi, 2015). The results showed that adding haptic exploration improved letter recognition and handwriting quality (Bara & Gentaz, 2011; Bara, Gentaz & Colé, 2007).

The purpose of this study is to assess the effectiveness of a remediation program in which the child learns the letters' shape and the gesture of handwriting without using a pen. This program was offered to a six year-olds child, diagnosed with dysgraphia. He participated in 10 individual learning sessions, twice a week. Half of the alphabet cursive letters were copied with a pencil and the other half of the letters were haptically explored with the hand. The child was asked to explore embossed letters with his hand in order to memorize their shape and to follow the outlines of curved letters with his forefinger in order to memorize the gesture and the stroke order. To evaluate the effect of the training, the child had to write under dictation and to copy the letters before and after the training sessions on a digitalized tablet. The results show an improvement of the stroke order and the quality of handwriting as well as a decrease in the number of pen lifts more important after the haptic exploration than after the copying training. Learning how to write letters without using a pen seems to be an interesting way to develop handwriting in dysgraphic children.

**Mots-Clés:** dysgraphia, handwriting, haptic

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