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Inter-letter spacing and eye movements in typical developing readers and dyslexics.

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Exploring the link between visual perception, visual-motor integration and reading : the clinical usefulness of battery DTVP-2

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Reading is known to be primarily a linguistic task and a large body of data shows that there are many linguistic factors that affect word processing (i.e. phonological awareness). However, to successfully decode written words children also need to develop good visual perception skills. Very recent literature shows that another skill seems to be also implicated in reading acquisition: motor abilities. That is, gross motor skills are reported to have significant correlations with reading (Knight & Rizzuto, 1993) and Longcamp, Zerbato-Poudou and Velay (2005) observed that handwriting training gave rise to higher letter recognition performances than typing training. Furthermore, dyslexia is frequently associated with visuo-attentional and motor disorders (e.g. : Bellocchi et al., 2013; Jover et al., 2013). Studying both the development of normal or deviant reading abilities and its predictors would allow to develop teaching or remedial methods and identify children at risk for later reading difficulty.

The purpose of this study was to evaluate a pre-existing battery to test visual perception and visual-motor integration (DTVP-2, Hammil, Pearson & Voress, 1993).

- 1) First we wanted to test how visual perception and visual-motor integration assessed in Kindergarten predict reading outcomes in 1st Grade in a group of 36 typical developing children.
- 2) Secondly, we aimed to evaluate if these abilities could be seen as clinical markers in a group of dyslexic children.

Study 1

Methods

Participants

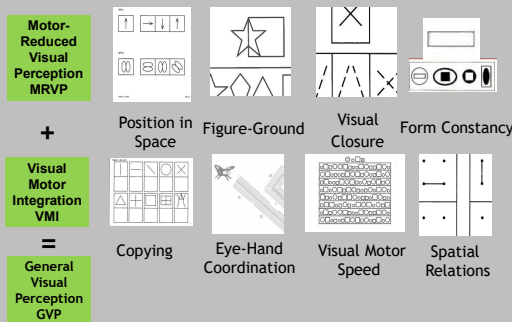
36 children (chr. age: mean 82,17; SD= 3,86 months)

Materials and procedure

2 times assessment:

Time 0 (Kindergarten)	Time 1 (May, 1st grade)
DTVP - 2	Reading - Alouette -R (Lefavrais,2005)

DTVP-2 subtests



Results

Predictions

Multiple linear regression.

DTVP	ALOUETTE		
	Accuracy	Fluency	Reading level
GVP	X	X	X
MRVP	X	X	X
VMI	✓	X	X

R²= .23; p < .05; VMI: B =.39; p < .05

Study 2

Methods

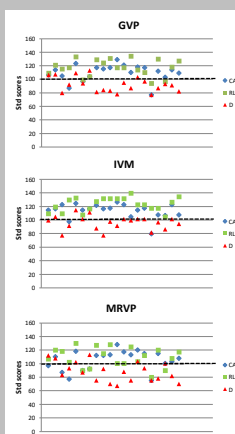
Participants

- ✓20 dyslexic children (chr. age: mean 114,3; SD= 11,3 months; lexical age: mean = 84,7; SD= 7,3)
- ✓20 CA controls (chr. age: mean 114,85; SD= 11,6 months; lexical age: mean = 123,2; SD= 7,3)
- ✓20 RL controls (chr. age: mean 83,3; SD= 5,8 months; lexical age: mean = 84,8; SD= 4,5)

Materials

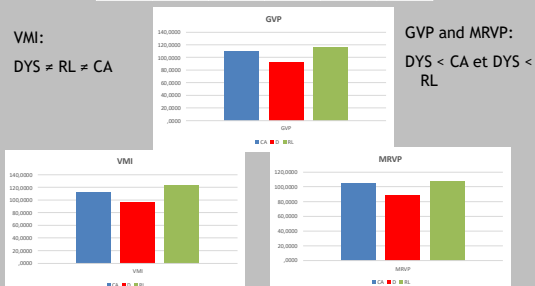
Reading Assessment : Alouette-R
Visual Perception and Visual Motor Integration Assessment : DTVP-2

Results



MANOVA

	Type III Sum of Squares	df	Mean Square	F	Sig.
GVP	6646,033	2	3323,017	23,986	,000
HRVP	4377,600	2	2188,800	8,311	,001
VMI	7534,933	2	3767,467	28,789	,000



Discussion

- ✓ Main results showed that only the visual-motor integration subcomponent predicts reading outcomes one year later, in line with recent studies (e.g.: Sons & Meseils, 2006; Longcamp, Lagarrigue & Velay, 2010).
- ✓ Furthermore, dyslexics showed lower visual perception and visual-motor integration abilities compared to normal readers. This last result is discussed taking into account the co-occurrence between dyslexia and other neurodevelopmental disorders.....

References