

1 **Movement detection thresholds reveal proprioceptive impairments in**  
2 **developmental dyslexia**

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11 **Supplementary Material**  
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	<b>Dyslexic group</b>		<b>Control group</b>	
	<b>N = 17</b>		<b>N = 17</b>	
	<b>VRT</b>	<b>ART</b>	<b>VRT</b>	<b>ART</b>
<b>Mean (SD)</b>	334.28 (52.28)	363.41 (50.51)	331.81 (33.41)	345.87 (30.85)
<b>Variable (SD)</b>	55.95 (36.26)	47.49 (21.51)	53.83 (27.41)	52.00 (37.73)

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15 **Supplementary Table 1.** Mean (SD) and variable (SD) reaction times (in ms) for vision and

16 hearing. VRT = Visual Reaction Time, ART = Auditory Reaction Time.

Speed ( $^{\circ}$ s $^{-1}$ )	<b>0.25</b>	<b>0.50</b>	<b>1</b>	<b>5</b>	<b>10</b>	<b>20</b>
<b>Mean (SD)</b>						
Dyslexic group	6.39 (3.25)	3.62 (2.03)	2.32 (1.43)	0.91 (0.27)	0.83 (0.18)	0.73 (0.12)
Control group	3.41 (1.74)	2.48 (1.21)	1.55 (0.38)	0.75 (0.15)	0.70 (0.10)	0.66 (0.10)
<b>Variable (SD)</b>						
Dyslexic group	5.14 (4.01)	2.06 (1.44)	1.44 (2.08)	0.26 (0.15)	0.17 (0.09)	0.13 (0.06)
Control group	2.32 (1.71)	1.36 (1.12)	0.53 (0.30)	0.19 (0.16)	0.15 (0.07)	0.13 (0.08)

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19 **Supplementary Table 2.** Mean (SD) and variable (SD) proprioceptive reaction times for dyslexics

20 and controls at all speeds.

EMG Activities (mV)	Dyslexic group	Control group	T-test
	N = 17	N = 17	
	Mean (SD)	Mean (SD)	<i>t</i> (32); <i>p</i> ; <i>cohen's d</i>
Biceps brachii	79.37 (27.81)	89.65 (8.58)	$t = 1.46$ ; $1.5e-1$ ; $0.50$
Brachio-radialis	87.65 (16.50)	92.47 (6.74)	$t = 1.11$ ; $2.7e-1$ ; $0.38$
Triceps brachii long head	81.05 (24.87)	88.57 (8.46)	$t = 1.18$ ; $2.5e-1$ ; $0.50$

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22 **Supplementary Table 3.** Ratios of muscle activations before motion start (-300ms) divided by  
23 maximum activation during the robotic motion. Uncorrected T-test comparisons of EMG ratios  
24 showed no group effect. Dyslexics and controls equally-well respected the instruction to keep their  
25 muscles relaxed during robotic manipulations.

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Pearson R		Read index		
		All n=34	Dys n=17	Cont n=17
Auditory	mean	-0,284	-0,306	0,033
	variable	0,011	-0,021	-0,122
	index	0,184	0,172	0,091
Visual	mean	-0,165	-0,389	0,174
	variable	-0,217	-0,317	-0,067
	index	0,159	0,376	0,002
Proprioception V0.25	mean	<b>-0,547</b>	-0,365	-0,108
	variable	<b>-0,593</b>	<b>-0,573</b>	-0,188
	index	<b>0,610</b>	<b>0,516</b>	0,148

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28 **Supplementary Table 4.** Pearson R coefficients are presented for correlations computed between  
 29 the reading ability index and reaction times. Correlations were computed merging the two groups  
 30 (1<sup>st</sup> column) and at the group level (2<sup>nd</sup> and 3<sup>rd</sup> columns). Within each sensory modality, correlation  
 31 with the read index was computed using mean reaction time, variable reaction time and an index  
 32 combining both mean and variable reaction times (see methods).