Supplementary Material

1. Word and pseudoword reading tests within the artificial orthography

1.1. List of words (left column) and pseudowords (right column) of the reading test within the artificial orthography. Note that the two lists were presently in separate paper sheets.

1.2. Translation of words and pseudowords written with the artificial symbols.

Words		Pseudowords
Dutch	Translation	
of	or	ot
fout	wrong	foun
zon	sun	zof
zei	said	teif
tot	until	fot
zout	salt	zoun
tent	tent	nent
zijn	are	zijf
ton	tons	fon
fijn	nice	nijf
net	not	fet
zou	would	oun
en	and	et
zet	move	tef

2. Principal component analysis to reduce the number of artificial symbol-speech sound learning task measures for subsequent analyses

We reduced the number of artificial symbol-speech sound learning task measures with a principal component analysis (PCA) with the accuracy and RTs values of Block 3 (identification task) and Block 4 (match/mismatch task). Factor loadings and proportion of variance accounted for by each of the components are presented in **Table S1**.

Table S1. Factor loadings and proportion of variance explained by each component extracted.

Variables	Component 1 symbol-speech sound accuracy score 47.94%	Component 2 symbol-speech sound speed score 36.90 %
Accuracy identification (Block 3)	.926	.121
Accuracy match/mismatch (Block 4)	.956	-.107
RTs identification (Block 3)	.111	.869
RTs match/mismatch (Block 4)	-.099	.903

3. Alphabetic letter-speech sound association skills and relationship with artificial symbol-speech sound learning measures in dyslexic readers

Table S2. Alphabetic letter-speech sound association skills in dyslexic readers: comparison with normative population.			
	M ± SD	t(54)	Percentage below normative range
Accuracy identification	38.95 ±10.79	-7.60***	51,8
Accuracy discrimination	41.04 ± 9.18	-7.24***	54,5
RTs identification	39.65±9.12	-8.41***	58,2
RTs discrimination	43.89±9.56	-4.74***	38,2

[a] Normative population: M = 50, SD = 10; ***p < 0.001

Table S3. Correlations between (alphabetic) letter-speech sound association measures and artificial symbol-speech sound learning measures in dyslexic readers.				
	Artificial symbol-speech sound learning paradigm			
Alphabetic letter-speech sound association (3DM tasks)	Acc. identification (Block 3)	Acc. match/mismatch (Block 34)	RTs identification (Block 3)	RTs match/mismatch (Block 34)
Accuracy identification	**.338***	.222	.126	.068
Accuracy discrimination	**.376****	.216	.158	.123
RTs identification	-.086	.058	.038	-.028
RTs discrimination	.058	-.038	.059	.106

*p < 0.05, **p < 0.01

4. Group comparison of auditory attentional skills in children with and without dyslexia

Before investigating the relationship between auditory attention skills and artificial symbol-speech sound learning, we examined potential group differences between children with and without dyslexia in the attentional measures.

For the auditory Stroop task, we tested incongruence (Stroop) effects on task accuracy and RTs (across children with and without dyslexia), and compared the magnitude of interference on children with and without dyslexia.

For the auditory sustained selective attention task, d-prime (Stanislaw & Todorv, 1999) was taken as a comprehensive measure of behavioural performance.

Statistical analyses

For the auditory Stroop data, as accuracy scores did not meet normality assumptions, a non-parametric Wilcoxon test was used to analyse mean accuracy, and a paired t-test was used to analyse median RTs. One participant from the typical reader group was excluded due to 9% accuracy in the incongruent condition. Across participants, omitted trials occurred only very rarely, with a maximum of 7 omitted trials, corresponding to less than 5% of total trials. We also used independent samples t-tests to ask whether children with dyslexia had weaker interference control. Interference control was measured by computing the difference between congruent and incongruent conditions in accuracy (incongruent-congruent) and RTs (congruent – incongruent).

For the auditory sustained selective attention data, we compared the two groups' task performance using a Wilcoxon rank-sum test, as d-prime scores did not meet normality assumptions.

Results

Results revealed a significant Stroop effect on both accuracy ($Z = -7.775$, $p < 0.001$; **Figure S1A**) and RTs ($t(108) = -4.542$, $p < 0.001$; **Figure S1B**). Thus, interference control was indexed as both the difference in accuracy (incongruent-congruent; hereafter 'interference control accuracy') and the difference in

median RTs (congruent - incongruent; hereafter 'interference control RTs'). Note that for both measures, more positive values indicate better interference control. Children with and without dyslexia did not show a significant difference on the two interference control measures (accuracy: t(107) = .302, p = 0.763; RTs: t(107) = .946, p = 0.346; **Figure S1C**). For the non-speech selective sustained attention task, d-prime (Stanislaw & Todorv, 1999) was taken as a comprehensive measure of behavioural performance. Mean d-prime was above chance, but with considerable variability across individuals (SD = 0.725). No significant differences were found between children with and without dyslexia (U = 938.5; p = .230; **Figure S1C**).

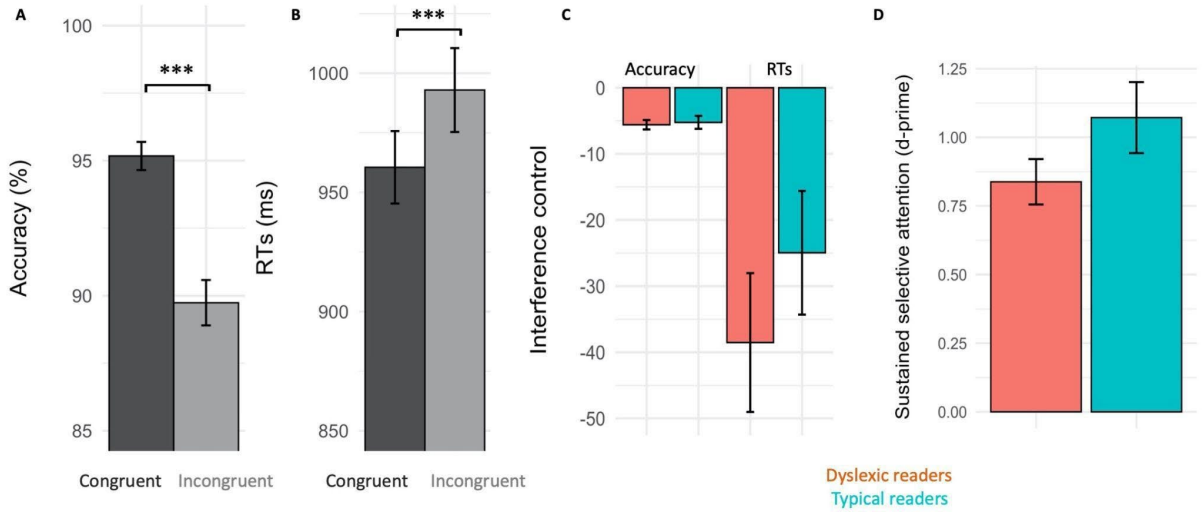

Figure S1. **A)** Response accuracy was lower and **B)** responses were slower in the incongruent condition compared to the congruent condition. **C)** Interference control in accuracy (incongruent-congruent) and in RTs (congruent - incongruent), and **D)** sustained selective attention did not significantly differ between children with and without dyslexia.