

Dispersion of response times in normal and dyslexic children

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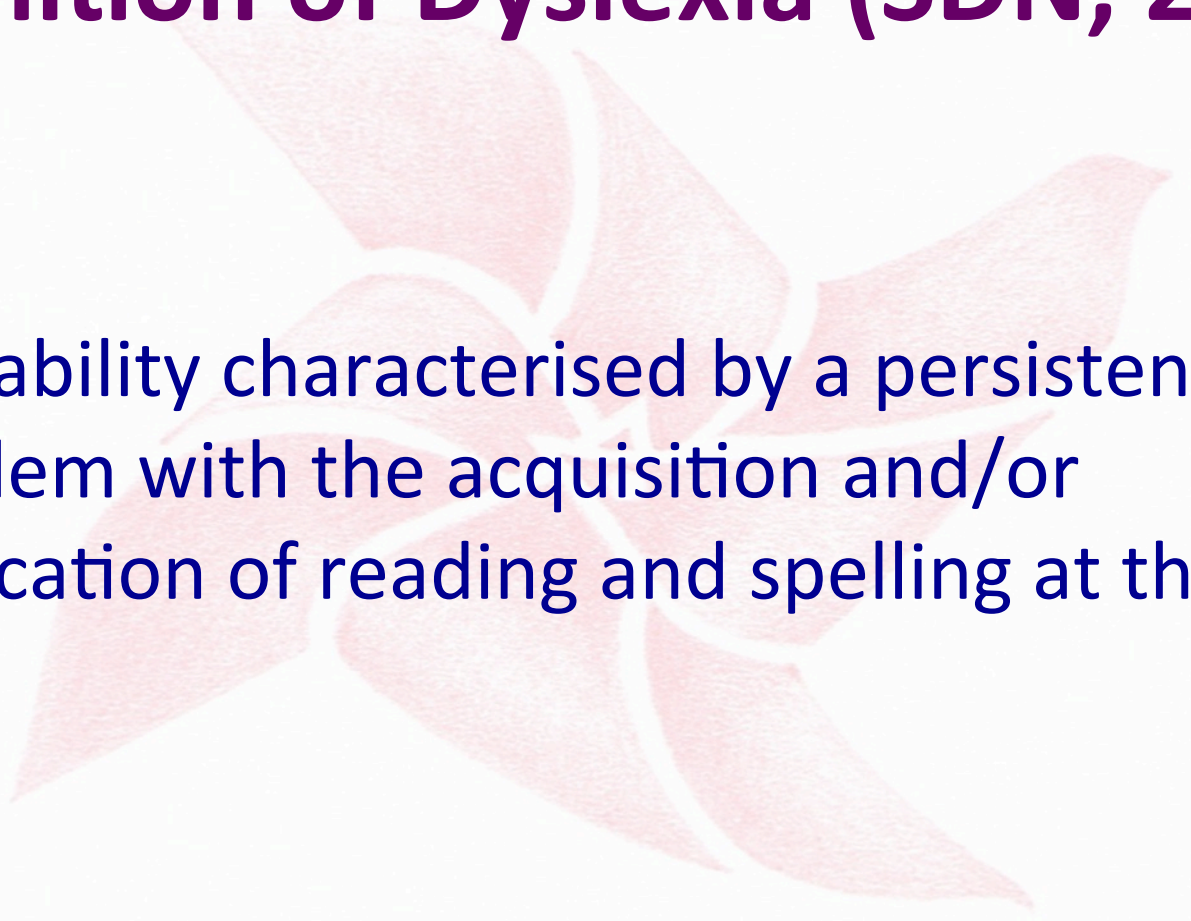
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Definition of Dyslexia (SDN, 2008)

A disability characterised by a persistent problem with the acquisition and/or application of reading and spelling at the word level

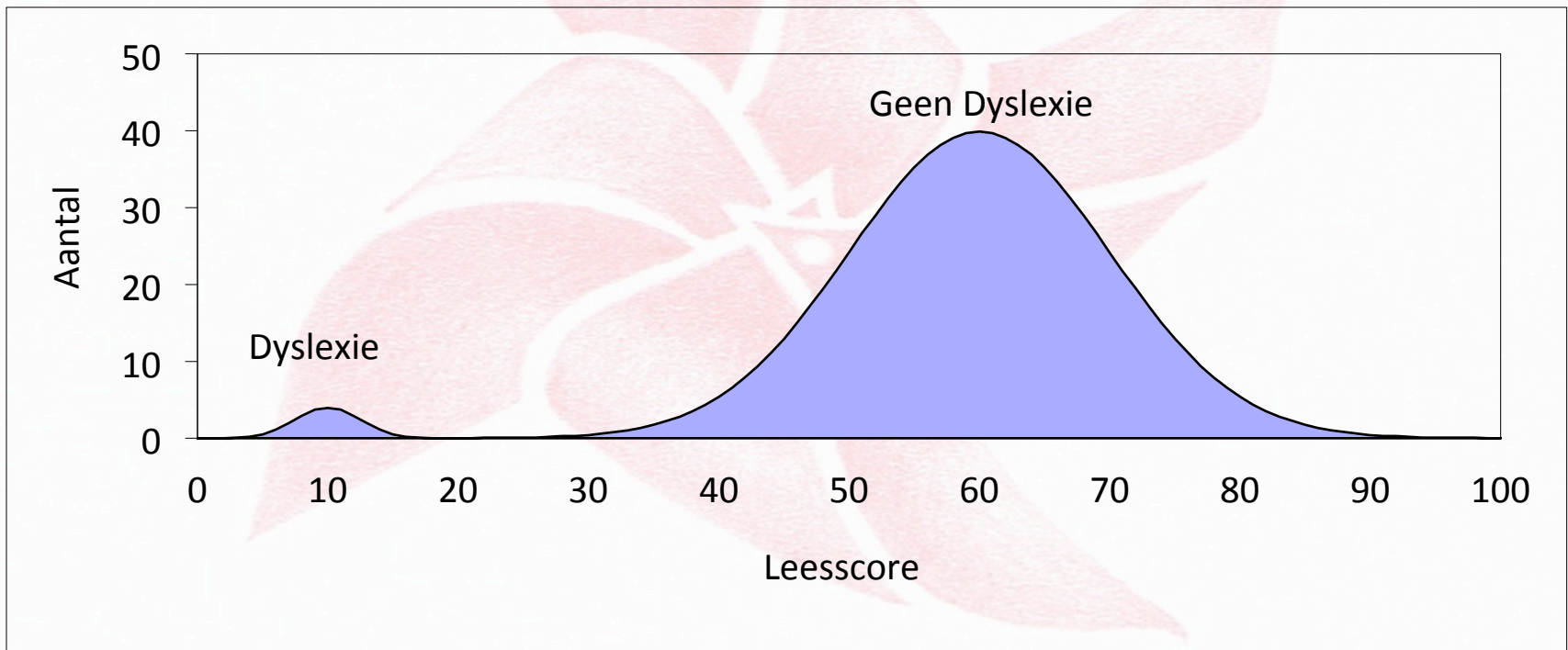


Diagnosis

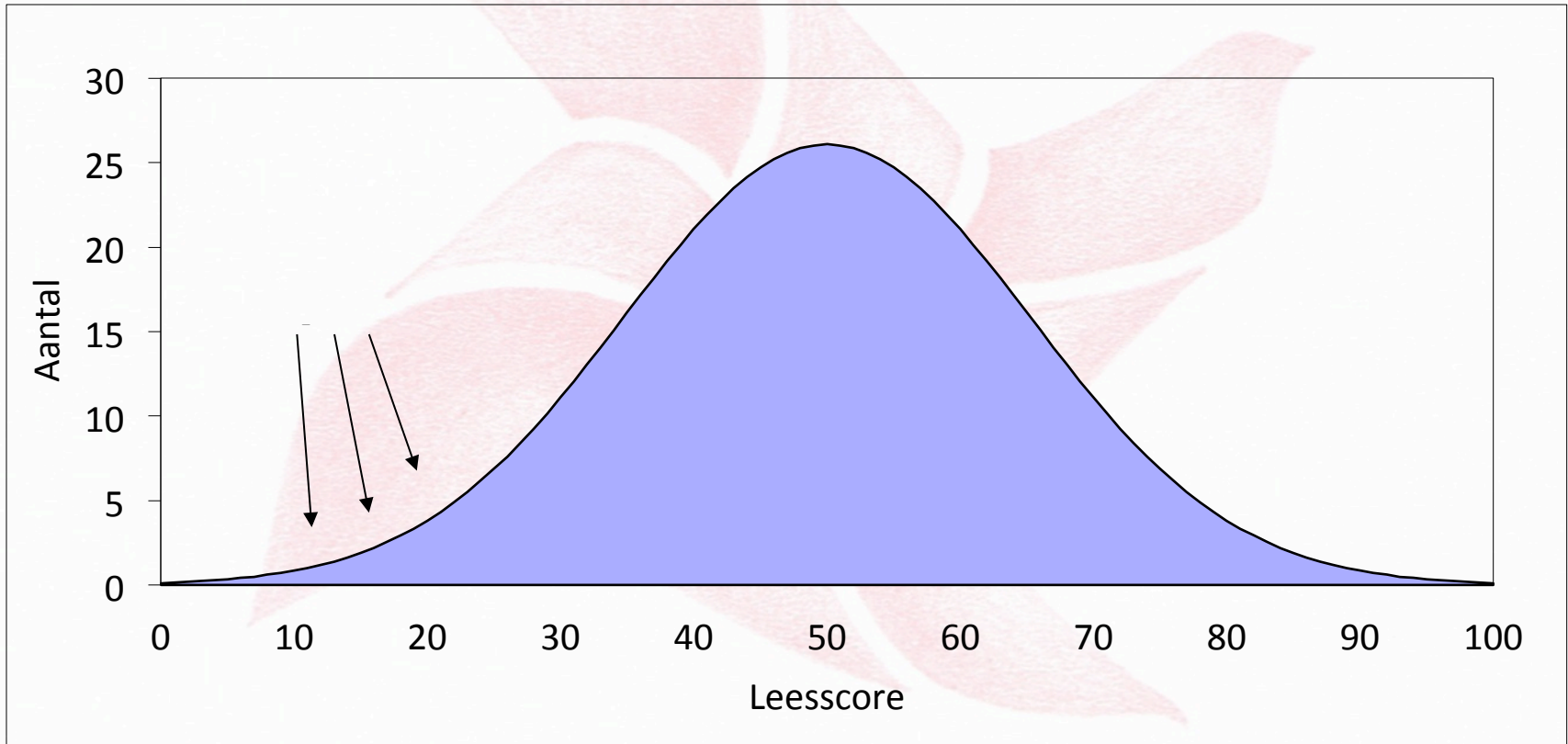


Reading and spelling skills are significantly below that what can be expected from an individual given his or her age and circumstances.

It could have been so nice, if...



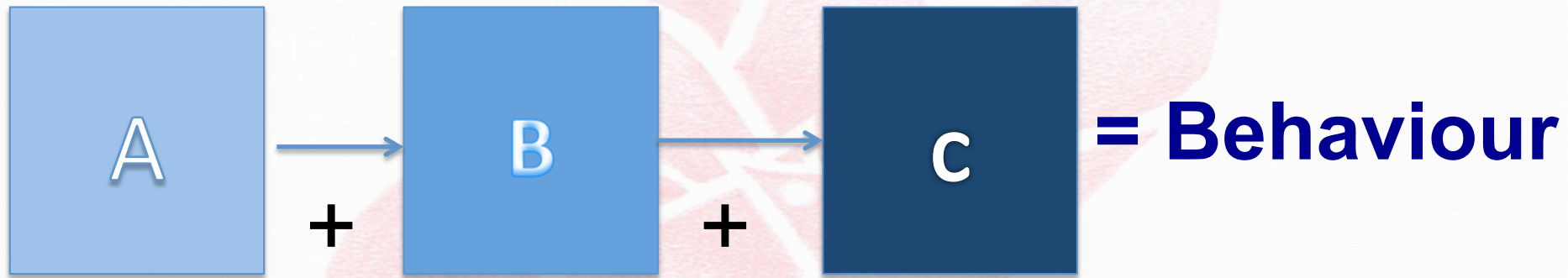
However, this is reality



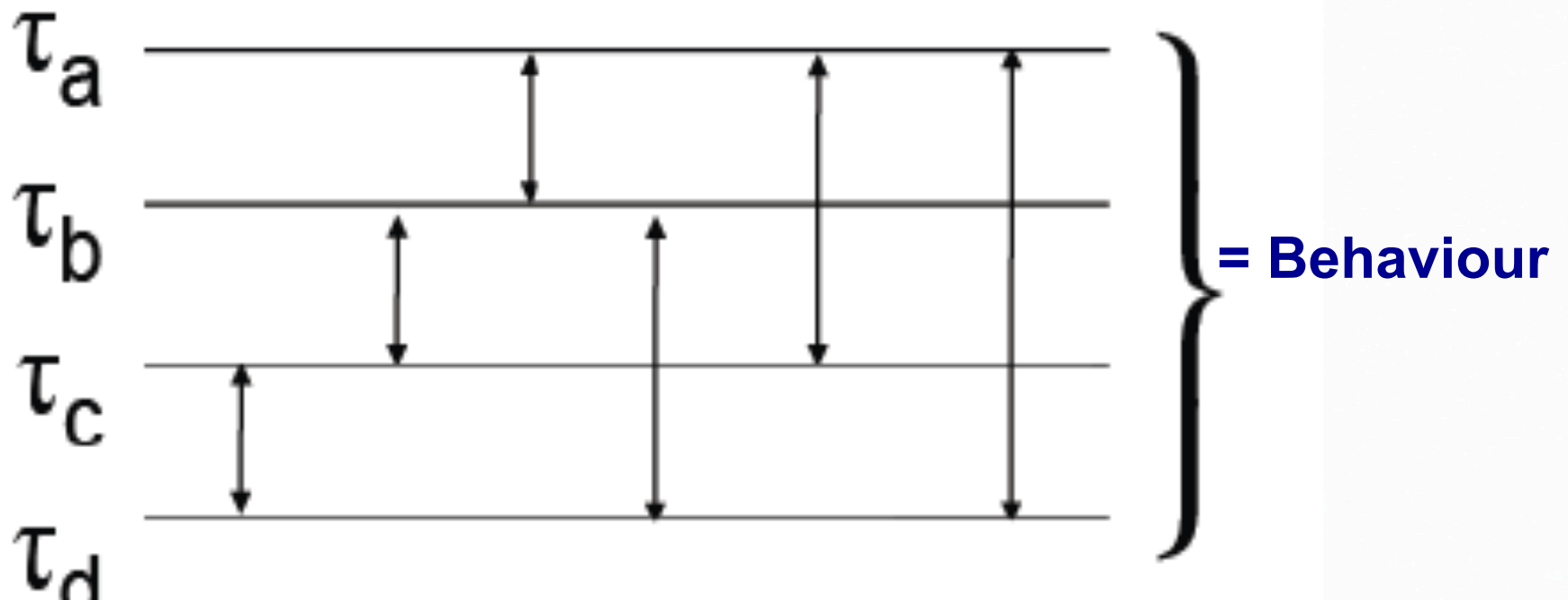
Dyslexia is associated with

- 1. Phonological awareness and memory problems**
 - 2. Orthographic awareness and memory problems**
 - 3. Visual-perceptual deficit**
 - 4. Magnocellulair deficit**
 - 5. Auditory-processing problems**
 - 6. Rapid-naming colours, numbers, etc...problems**
 - 7. Attention-deficit problems**
 - 8. Motor problems**
 - 9. Language-related problems**
 - 10. Neurobiological factors**
 - 11. Environmental problems**
 - 12. etc.....**
- 

Additive perspective on cognition

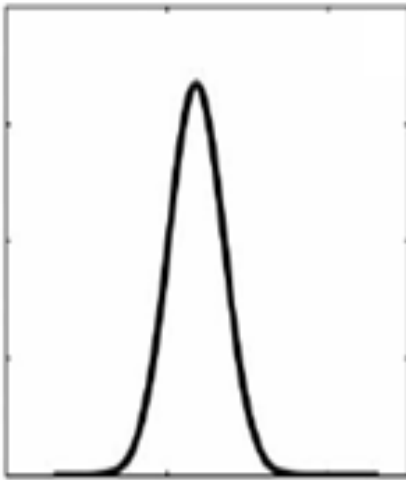


Interaction dominant perspective on cognition



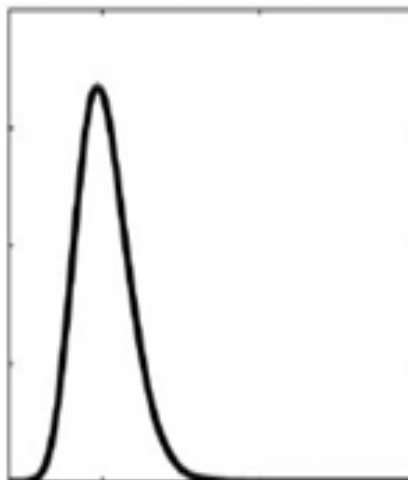
Types of distributions

A



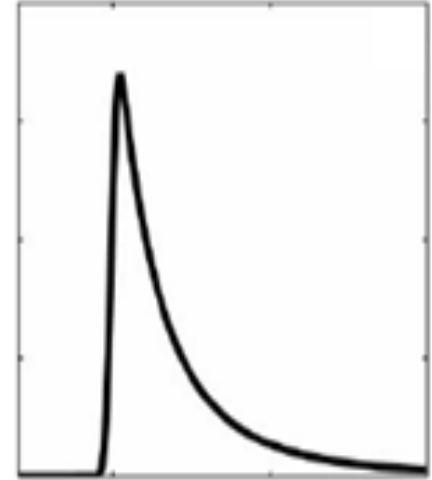
Gaussian

B



Log-normal

C



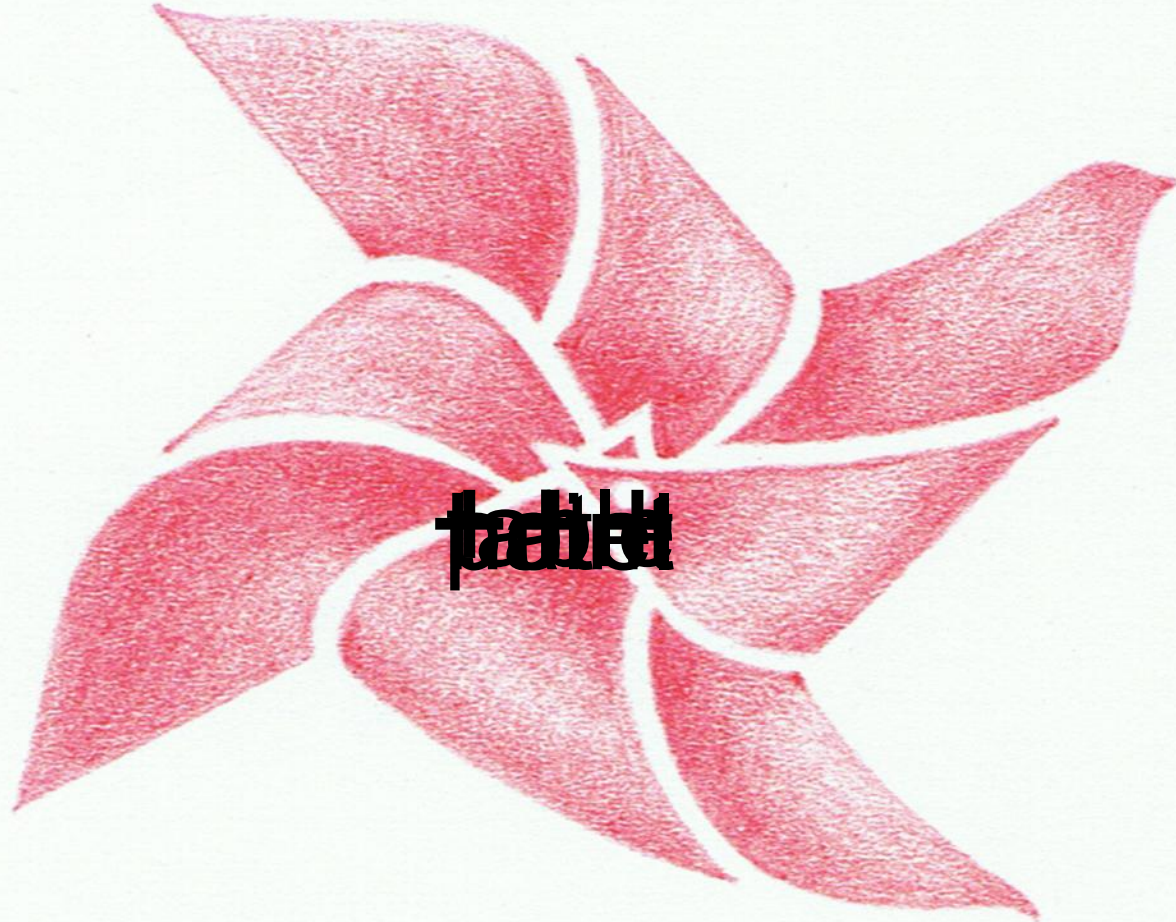
Power law

Participants

	Dyslexic	Non dyslexic
Girls / Boys	7 / 13	8 / 15
Word-reading score*	≤ 6	≥ 12
Pseudoword-reading score*	≤ 6	≥ 12
Age in years	between 11 and 13	

* Standard score: $M = 10$, $SD = 3$; Below 6 serious reading problem

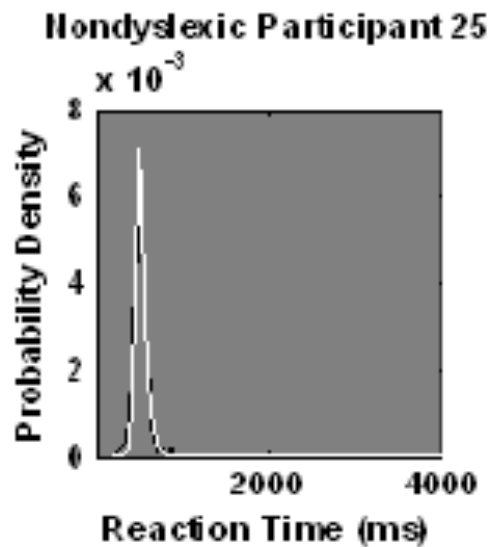
Continue Leestaak



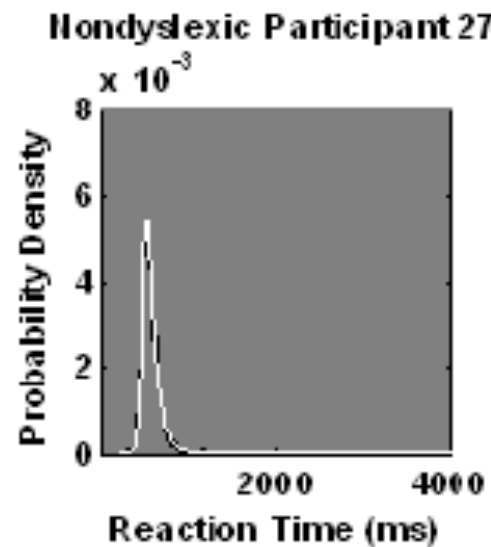
560 words were read in one session
RT's and errors were measures

Distributions

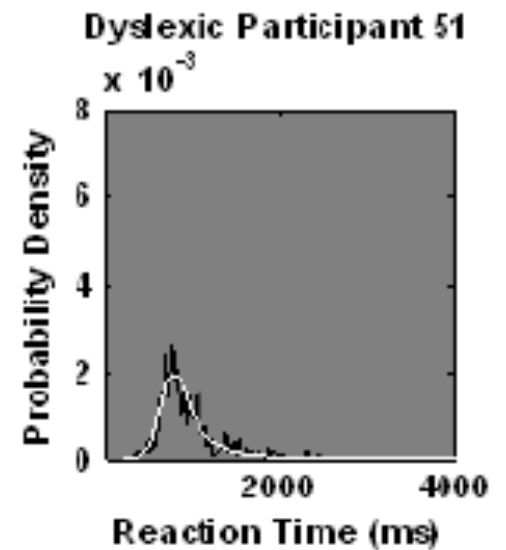
A



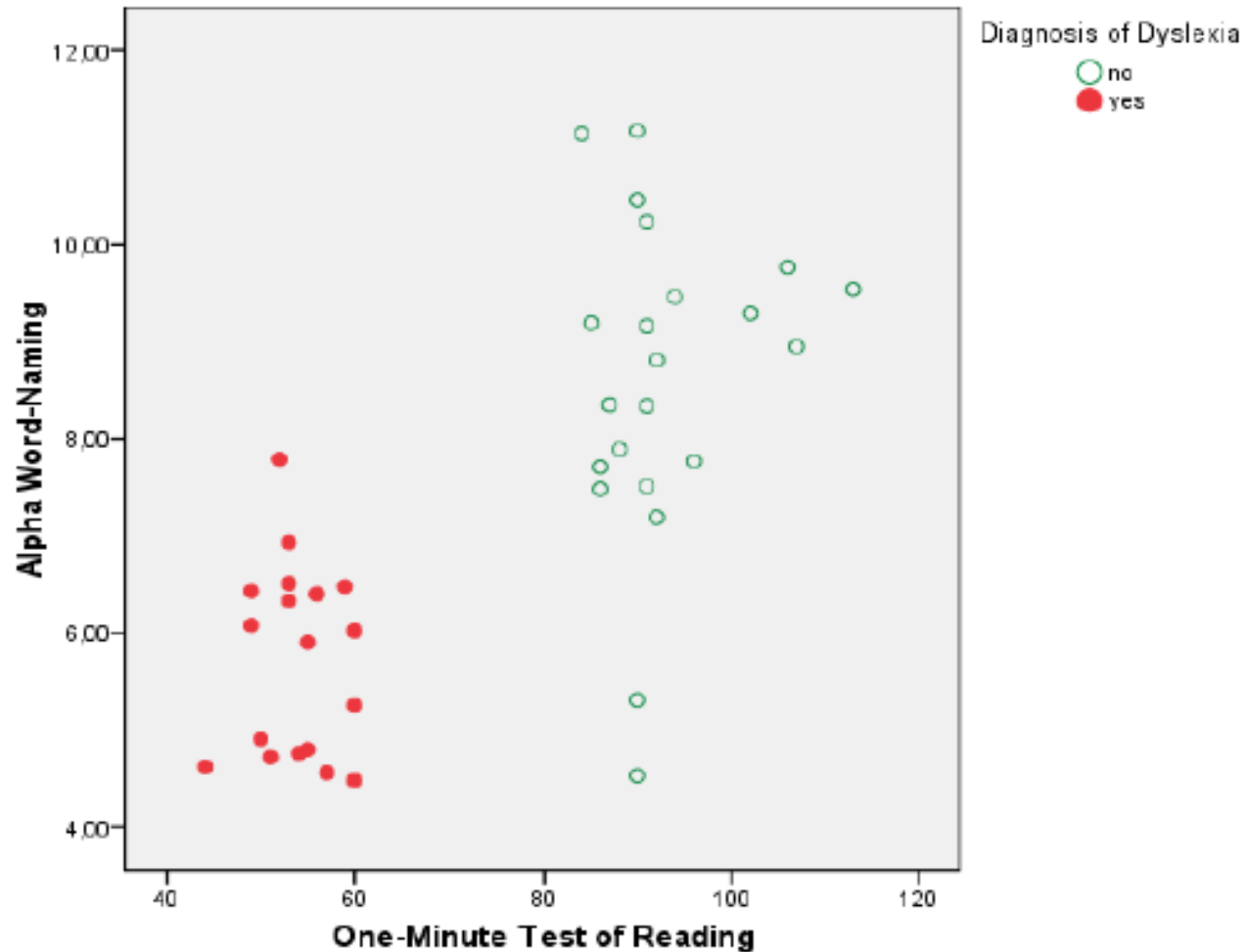
B



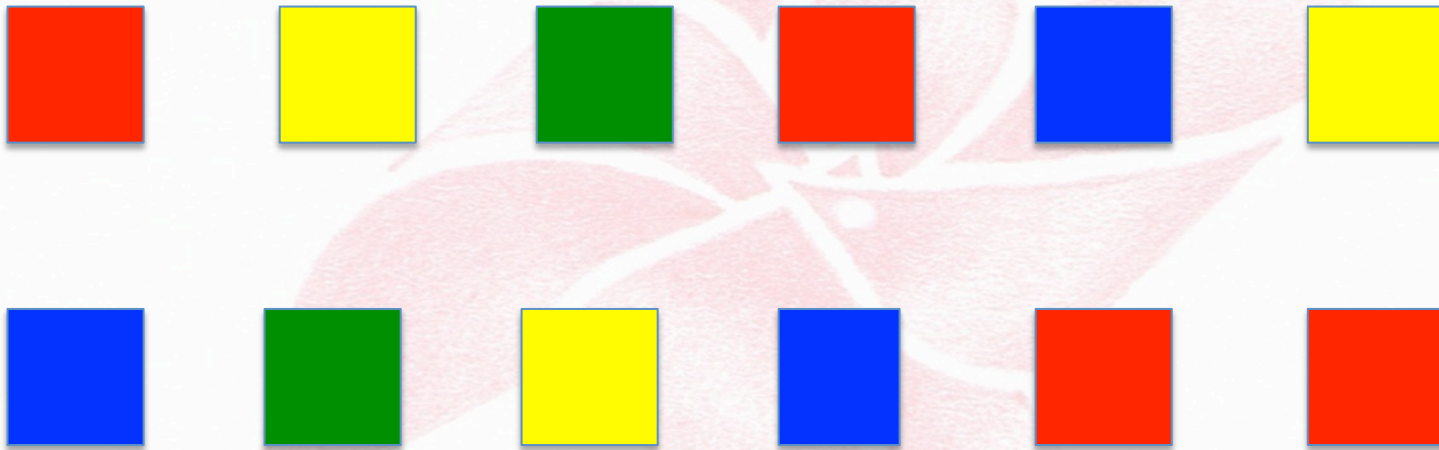
C



α -parameter divides groups



Rapid-naming of colours



..... $n = 560$

Arithmetic-decision task

$$3 + 4 = 7 \text{ (yes)}$$

$$3 - 1 = 1 \text{ (no)}$$

$$4 + 2 = 5 \text{ (no)}$$

$$3 + 5 = 8 \text{ (yes)}$$

$$7 - 1 = 6 \text{ (yes)}$$

$$7 + 1 = 6 \text{ (no)}$$

$$6 + 3 = 9 \text{ (yes)}$$

$$1 + 1 = 3 \text{ (no)}$$

$$9 - 1 = 6 \text{ (no)}$$

$$7 + 2 = 8 \text{ (no)}$$

etc..

.....

.....

$n = 560$

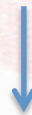
Erikson-flanker task

trial a => => => => => (max congruent)

trial b => => <= => => (max discongruent)

trial c <= <= <= => =>

trial d <= => => <= =>



..... $n = 560$

Number of Log-normal distributions

Dyslexic				Non- dyslexic		
3	2	1		4	1	2
2	2	0		3	3	2
0	0	1		2	3	2
2	1	0		4	2	4
1	1			2	3	2
2	0			4	3	3
0	1			4	3	
1	1			4	2	
(n = 21) M = 1.0				(n = 62) M = 2.8		

Conclusion

Dyslexic readers are also more prone to power-law behaviour than non-dyslexic readers in cognitive tasks that do not require reading

**Behaviour is the result of
an interactive complex system,**

that is why:

Misfortunes hardly come singly

Many thanks to

Lieke Greijn, MSc.



the late Dr. Guy Van Orden

