

# History of the Reading Dysfunction

## Speech phone perception is comorbid

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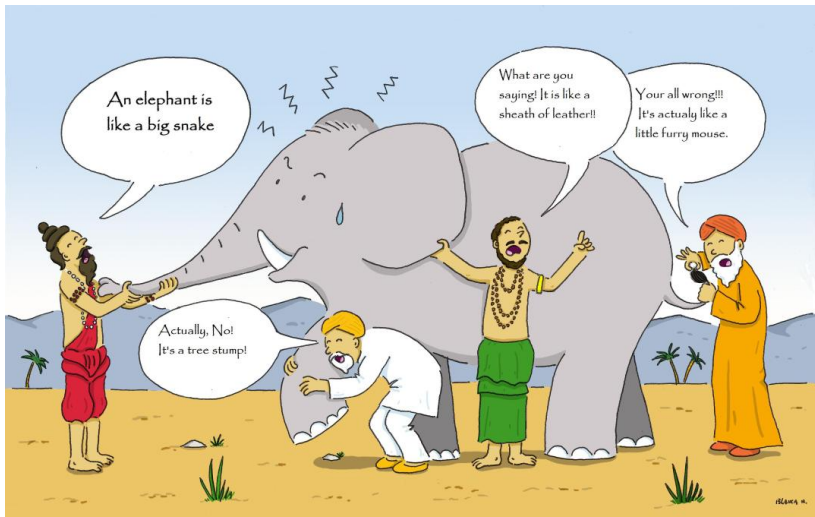
[http://www.auditorymodels.org/\[Talks\]](http://www.auditorymodels.org/[Talks])

MARC Springfield IL, July 9, 2019 / Jul 12, 2019

July 9, 2019

# The history of reading disability

- Is it: Brain damage, disorder, dyslexia, or a learning dysfunction?



# History of reading dysfunction (RD)

- “It’s All in the Brain”?: An Invitation to Analyze the Discursive History of the Israeli Neurological Conceptualization of Learning Disabilities (Katchergin, 2015)
  - A terminology crises (2015):
    - Broad ranging opinions about sources of RD
      - 1 Brain damage? (1960)
      - 2 Learning disability? (1965)
      - 3 Special readers (1985)
      - 4 Parents enrage and engage (1995)
      - 5 Confusion and more politics (present)

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    - 1 Statistics on reading LD programs: 50% of special education
    - 2 2.9 million children (1999-2000)
    - 3 Fastest growing population for all high-incident LD's
    - 4 From 1976-1982: annual growth rate of 130%
    - 5 LDs: 9.5% in Massachusetts and RI; 3% in Kentucky and Georgia
    - 5b >50% of the incarcerated population have RD of varying degrees  
RD is a ticket to jail
    - 7 No LD input from psychology, medical, linguistics and speech research
    - 6 Int. Acad. Resh. LD (IARLD): Sole resource for LD international resh.



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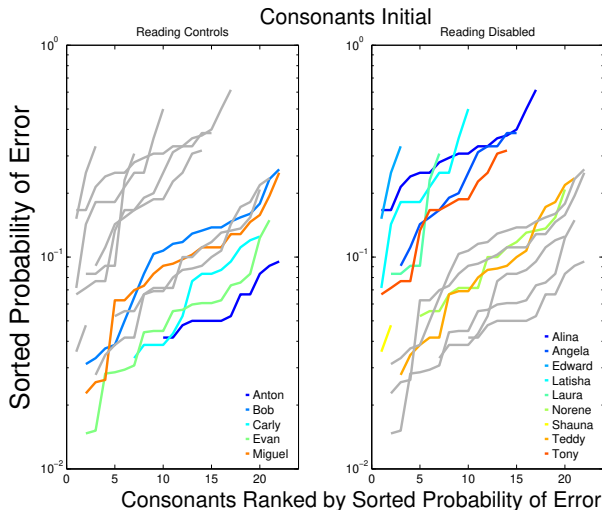
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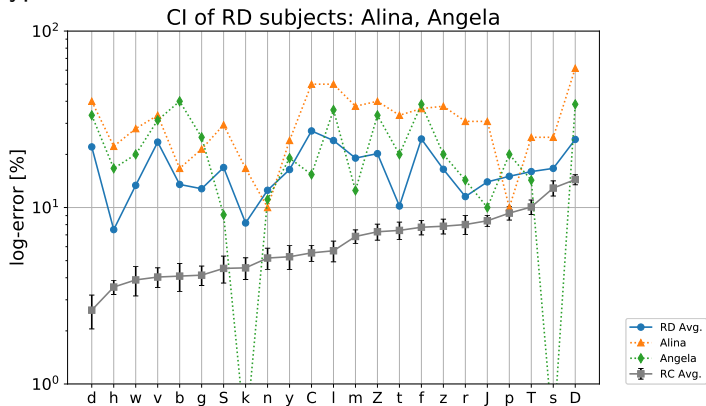
# Methods: Allen, Johnson (2005-2019)

- 12 RD children; 10,000 trials per child over 1-2 mos of testing



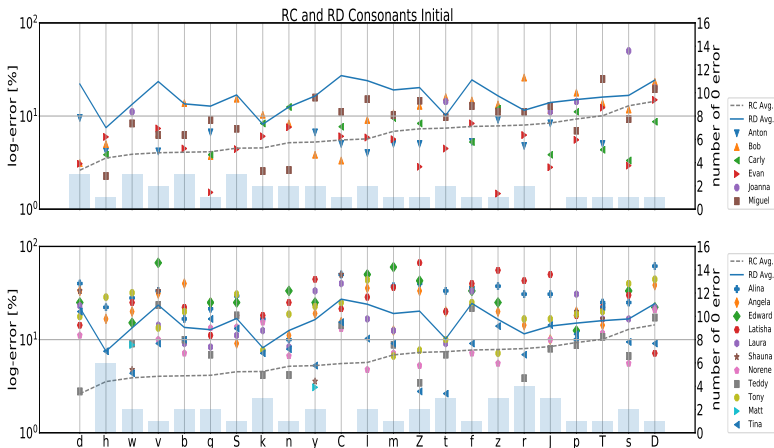
## 2 typical RD children to RD and RC mean scores

- Solid blue: means of 9 RD children; Solid gray: RC means; Dashed: two typical RDs



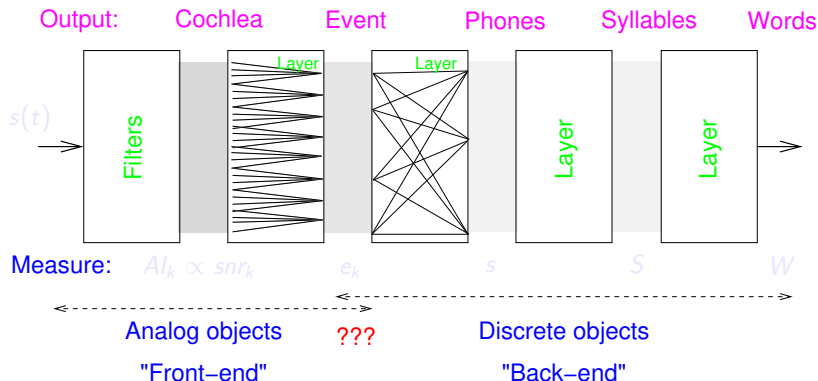
# Consonant Initial: Top RC, Bottom RC

- Points are individuals: Top RC, Bottom RD
- Solid lines are means of RD; Dashed lines means of RC



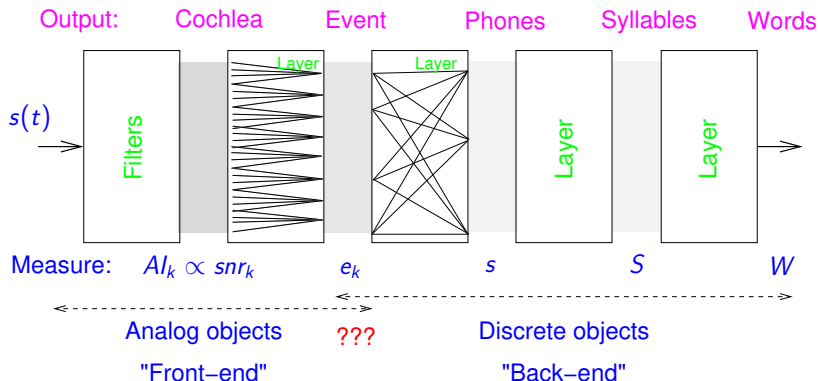
# Fletcher's AI model Allen (2005)

- RD have normal hearing, but cannot decode all the phone features
- RD children are highly idiosyncratic in their phone feature decoding



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# Conclusions

We have:

- Reading disabled children are similar to hearing impaired, **but with no cochlear loss**
  - for  $\approx 9$  RD subjects
  - $N > 10,000$  trials per child
  - CI, CF, VI, VF
  - Highly idiosyncratic results across RD subjects
- To label consonants, in 2005 we have shown that **normal listeners** use:
  - plosive timing, frequency edges & pitch modulated frication, and
  - *across-frequency timing coincidences*
- RD have not mastered: **phonemic awareness skills**
- These should be learnable

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# Thank you for your attention

[http://auditorymodels.org/\[Talks,Demos\]](http://auditorymodels.org/[Talks,Demos])

## Bibliography

Allen, J. B. (2005). Consonant recognition and the articulation index. *J. Acoust. Soc. Am.*, 117(4):2212–2223.

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Torgesen, J. K. (2004). Learning disabilities: An historical and conceptual overview. In *Chapter 1: Learning about learning disabilities*, pages 3–40. Elsevier.