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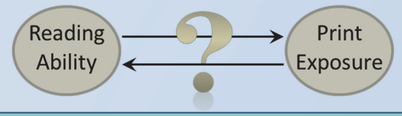
Studying Causality Between Reading Ability and Print Exposure

Background

Do children who read more become betters readers?
Do poor readers avoid reading?
Or is there a reciprocal link?



Only three **previous longitudinal studies** tested (rather than assumed) the direction of effect [1,2,3]. Contrary to common belief [4], they seem to suggest that reading ability predicts print exposure.
We define **print exposure** as how much children read of their own volition and not as prescribed by school.

1. Longitudinal Study

Why are practice and performance related? Development of reading from age 5 to 15

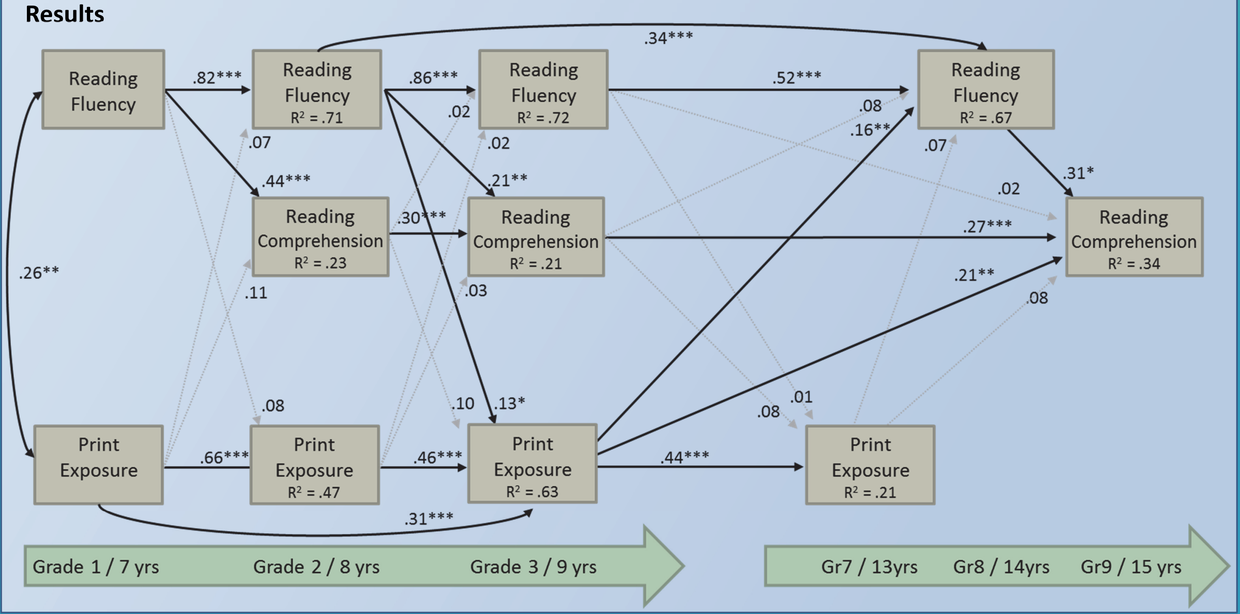
Elsje van Bergen, Kati Vasalampi, & Minna Torppa
Under revision for *Developmental Psychology*

Rationale
Compared to the three previous studies, this study separated reading fluency and comprehension, and it spanned a longer developmental period.

Method

Participants	*N* = 200 Finish children from the Jyväskylä Longitudinal Study of Dyslexia
Measures	
Reading fluency	Time needed to read a text
Reading comprehension	In Grades 1-8 informative texts with questions; In Grade 9 PISA Reading
Print exposure	Parental report on 4 to 6 items on amount of independent reading

Results



2. Twin Study

Why do children read more? The influence of reading ability on voluntary reading practices

Elsje van Bergen, Margaret J. Snowling, Eveline L. de Zeeuw, Catharina E.M. van Beijsterveldt, Conor V. Dolan, & Dorret I. Boomsma

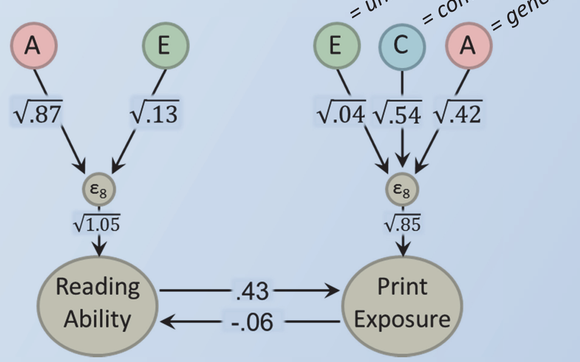
In press in *Journal of Child Psychology and Psychiatry*, doi: 10.1111/jcpp.12910

Rationale
Reading ability is very stable. Therefore, after controlling for the autoregressive effect of reading ability there is little variance remaining for any other variable to explain. An alternative design is the behaviour-genetic "direction of causality" model [5].

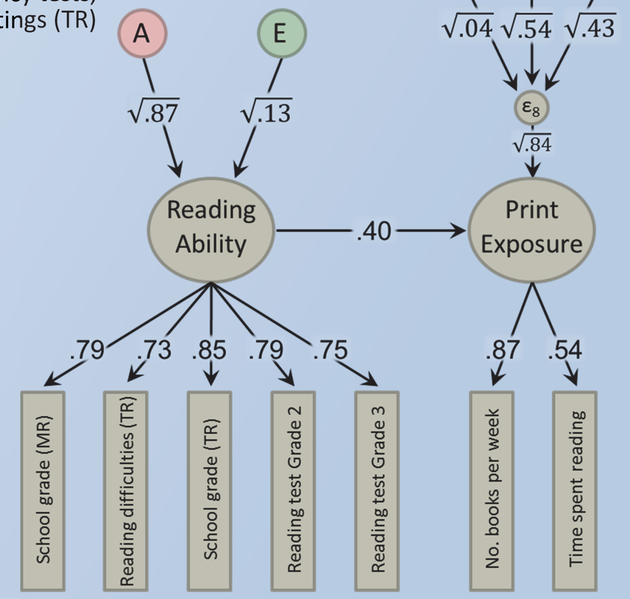
Method

Participants	*N* = 11,559 twin children **aged ~7.5** from the Netherlands Twin Register
Measures	
Reading ability	Combination of word-reading fluency tests, mother ratings (MR), & teacher ratings (TR)
Print exposure	Mother report

Results



The "print exposure → reading ability path" in the left model can be dropped, resulting in the final model on the right.



Conclusions

- In the early school years, effects of reading ability to print exposure were stronger (implying genetic niche picking). The effect of accumulated practice only emerged in adolescence (longitudinal study).
- Individual differences in reading ability are mostly due to genetic differences, whereas individual differences in print exposure have equal genetic and environmental origins (twin study).
- Individual differences in reading ability predict print exposure, rather than vice versa (twin study).
- Children's basic reading skills fuel how much they choose to read (both studies).
- We expect that a decoding intervention can also positively impact children's reading habits.

References:
[1] Aarnoutse & van Leeuwe (1998). doi:10.1076/edre.4.2.143.6960
[2] Harlaar, Deater-Deckard, Thompson, DeThorne & Petrill (2011). doi:10.1111/j.1467-8624.2011.01658.x
[3] Leppänen, Aunola & Nurmi (2005). doi:10.1111/j.1467-9817.2005.00281.x
[4] van Bergen (2017). Twitter poll. https://twitter.com/drElsje/status/874538280628486144
[5] Heath, Kessler, Neale, Hewitt, Eaves & Kendler (1993). doi:10.1007/BF01067552