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MACQUARIE
University

What happens to children with dyslexia when they grow up?

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<http://www.hailuototourism.fi/sivu/en/>





Answer:
Many will go to the university near you



We all know that Richard Branson, Henry Winkler, Whoopi Goldberg, King of Sweden (and her daughter, crown princess Victoria) and Orlando Bloom have dyslexia



Maybe we also know of John Irving's dyslexia, or of Jeanne Betancourt, Max Brooks, Octavia Butler, Blake Charlton, Nola Chee, Agatha Christie, Gareth Cook, Carmen Agra Deedy, Richard Engel, Gustave Flaubert, Patricia Polacco, Philip Schultz, Victor Villasenor, Wendy Wasserstein, and William B. Yates (Nobel Prize, Literature 1923)



We may have heard of Einstein's learning difficulties, or possible dyslexia of Alexander Graham Bell, but what about Baruj* and Beryl Benacerraf, Pierre Curie, Michael Faraday, Carol Greider*, Jack Horner, Willem Johan Kolff, James Clerk Maxwell, John Skoyles, and Niko Tesla

Official numbers

AND THEY ARE UNFORTUNATELY VERY SKETCHY

MORE INDIVIDUALS WITH A HISTORY OF READING DIFFICULTIES ATTEND TERTIARY EDUCATION NOW THAN EVER BEFORE

- Definitely true for those who have a formal diagnosis, but not sure if this is simply because more individuals are diagnosed, diagnosis is now less stigmatizing, or because diagnosis can lead to important accommodations
- Early estimates of “compensation” – meaning here ability to complete at least some reading tasks at normal level – were somewhere around 20 to 25%. These numbers are probably grossly inaccurate now.
- In UK (where dyslexia diagnosis seems more likely than for example in Canada) universities report that about 3% of first year students have dyslexia. The latest Canadian estimate is that about 3% have LD and most of those have RD.

Australian numbers

- Existing estimates seem very similar to UK and North America, and so does the observation of rising numbers
- “The University of XXXX has hundreds of successful students with Specific Learning Disabilities studying across a range of subject areas.”
 - Messaging -- compare to “Tertiary study is challenging and it is important to undertake a realistic study load” as a first sentence.

Alternative look at numbers

- When we ask large cohorts of first year students about their history of reading acquisition difficulties, 15 to 35 percent report having experienced significant difficulties in learning to read (less in larger research intensive universities, more in smaller teaching intensive universities)
- Self-report of a history of reading acquisition difficulties results in five to ten times higher estimates than self-identification with diagnosis and registering with support services (at least in Canada)
 - Many individuals with a history of reading difficulties do not disclose their problems to the institutions and do not want to be treated differently from any other student

How different are these two groups of students?

- Not that different at all!
 - Both groups have phonological processing problems (3 to 5 years)
 - Both groups have poor nonword reading skills (4 to 5 years)
 - Both groups have relatively poor word reading skills (2 to 4 years)
 - Reading speed of those without diagnosis is about 40 words per minute slower than controls (190 wpm versus 230 wmp) whereas those with diagnosis are another 30 wpm slower (about 160 wpm) when measured with relatively complex text
 - Untimed reading comprehension of students with diagnosis equal to the controls (87% and 89% of the questions answered correctly), and better than that of self-report students (77%)

Deacon, Cook & Parrila (2012), Parrila, Georgiou & Corkett (2007)

How individuals with a history of reading difficulties succeed in highly literate learning environments?



And not only history of but
continuing problems with:

- Phonological awareness
- Rapid naming
- Nonword reading
- Word reading (fluency in particular)
- Reading rate

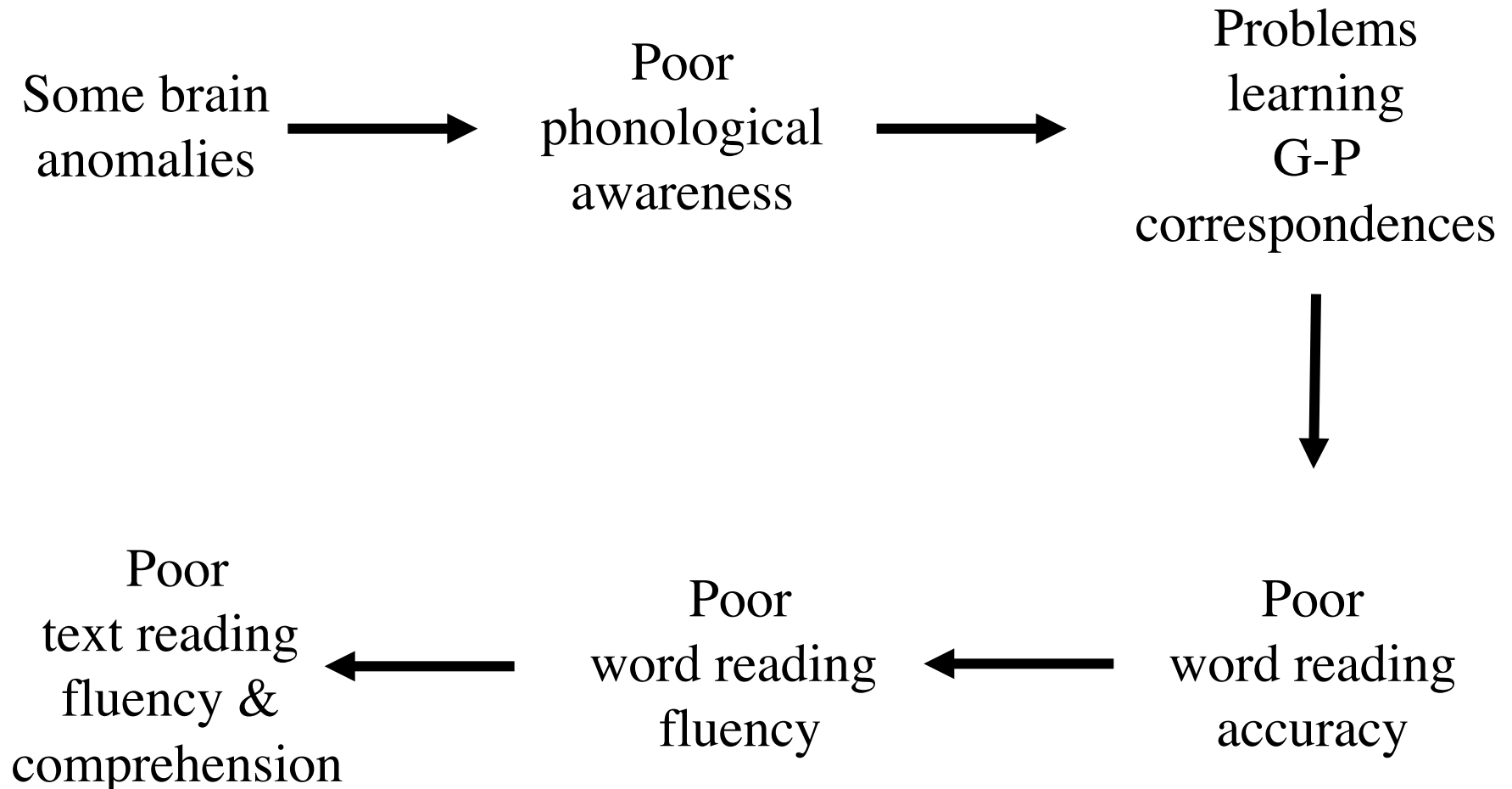
Assumption 1: They must be really smart
("gifted LD")

Assumption 2: They must have really good
vocabulary/visual memory/oral learning
skills/etc.

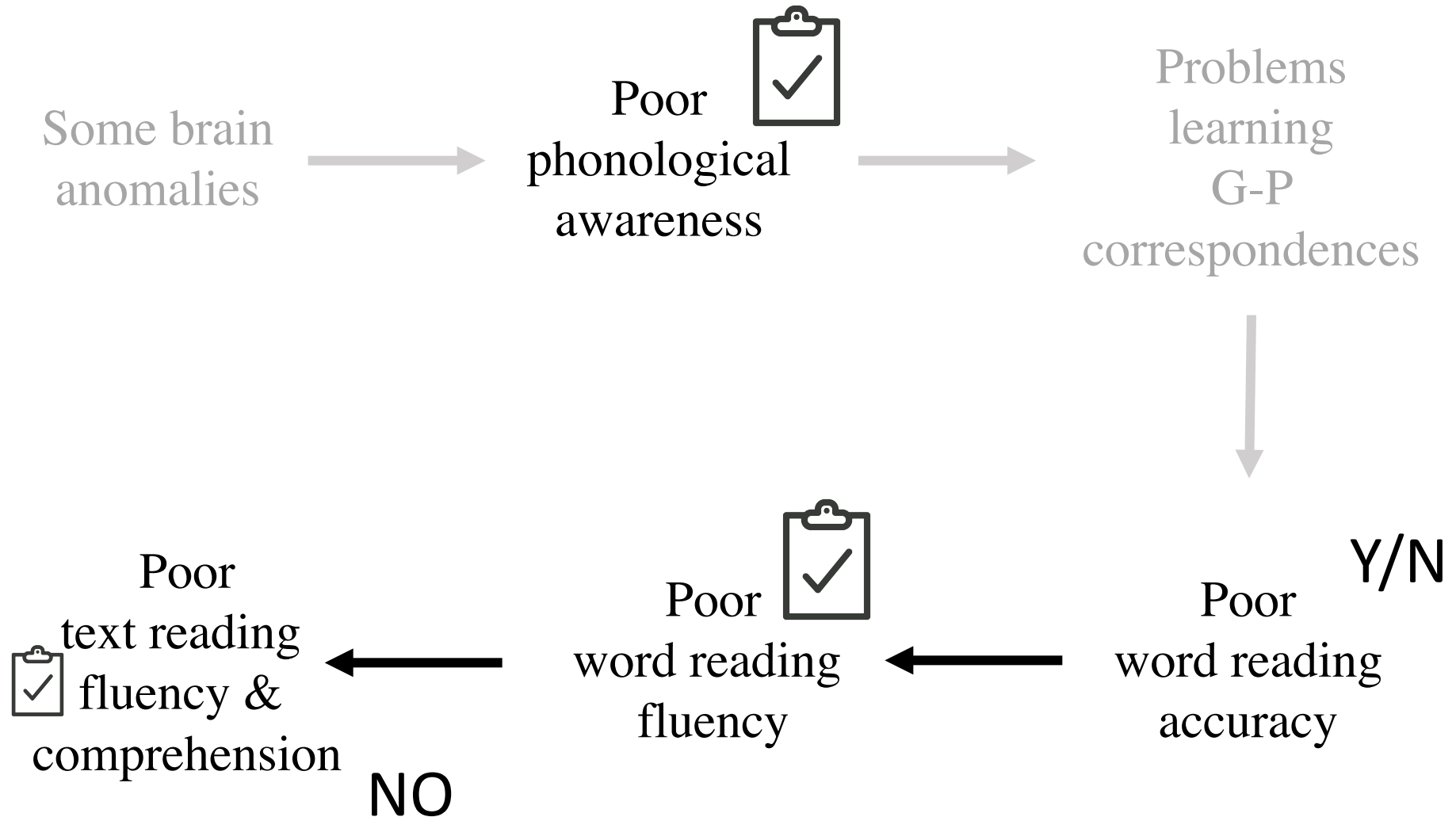
Some reading theory problems

- Phonological awareness
- Nonword reading
- Word reading (fluency in particular)
- Reading rate

Simple Causal Model of Dyslexia



Too simple?



Assumption 3: At least some individuals with a history of reading acquisition problems must have developed alternative ways to identify words accurately (the first equifinality assumption)

Hypotheses

- Maybe it is possible to bypass phonemic processing (to some extent) by using larger (regular?) chunks
 - Morphemes may be the unit of decoding → better morphological awareness/processing
- Maybe it is possible to develop better “sight word” recognition via some alternative mechanisms
 - The dominant theories argue that you need successful phonological decoding experiences to develop “sight words”
 - Strong (alternative) orthographic learning skills?

Well, maybe:

- We were not able to ascertain any morphological benefit, and possibly a deficit (conflicting results in other studies as well)
- Orthographic learning seems intact
 - Supports reading, maybe simple spelling, but not integrated with phonological representations

A lot of work left to do here

- Reading comprehension
 - Why dysfluent reading doesn't have the expected negative impact on comprehension?
 - Why oral reading errors seem to affect some individuals comprehension but not others?
 - Why some individuals with dyslexia seem to be able to have very intense aesthetic experiences with fiction texts despite continuing reading problems at the word level? Do these individuals process also non-fiction differently?
 - Working memory?
- Word reading
 - Partial orthographic representations – when is a representation of a word “good enough” for learning from text?

Preliminary conclusions

- While these results were exciting (and we are continuing to look into orthographic learning and reading comprehension) both theoretically and practically, they don't explain compensation in academic achievement.

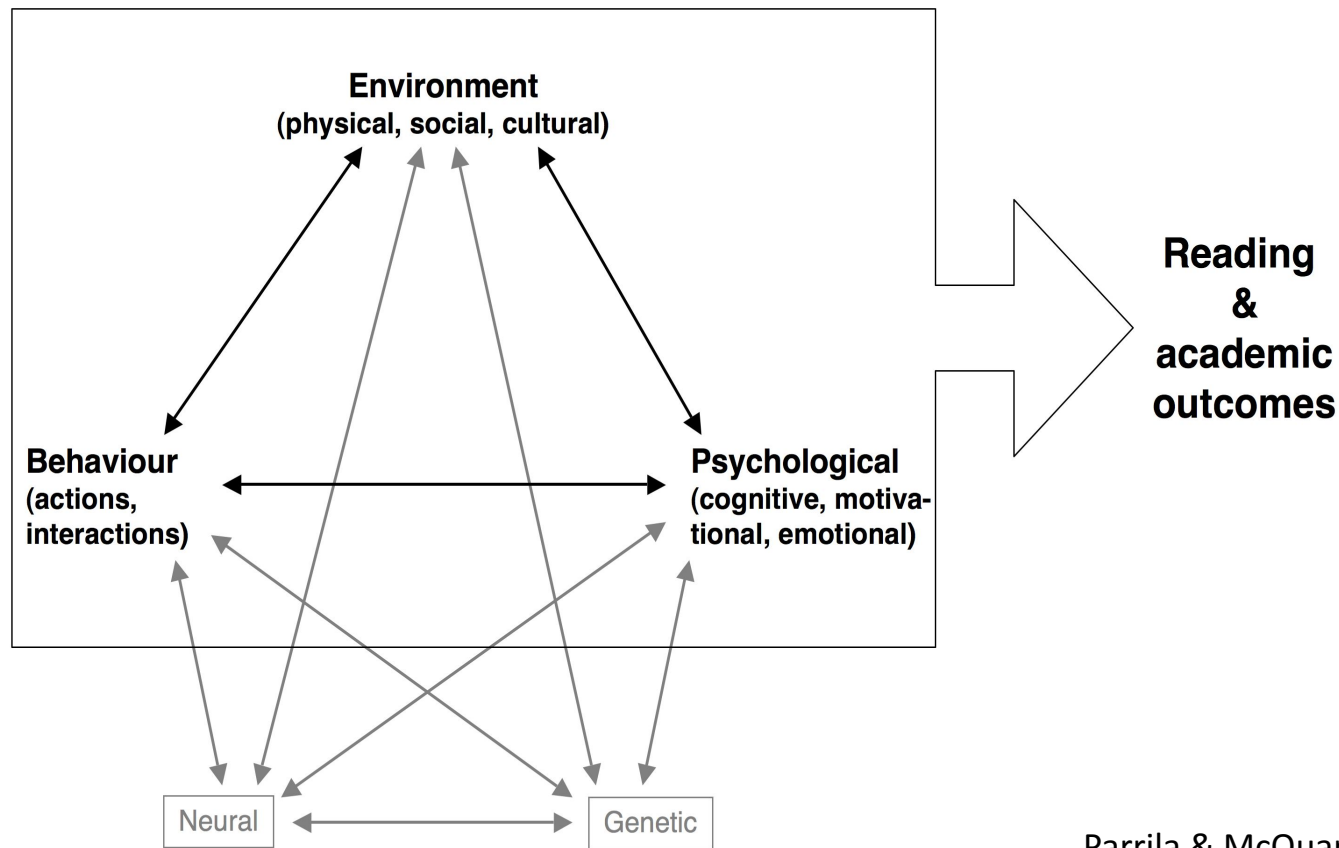


Expand the search



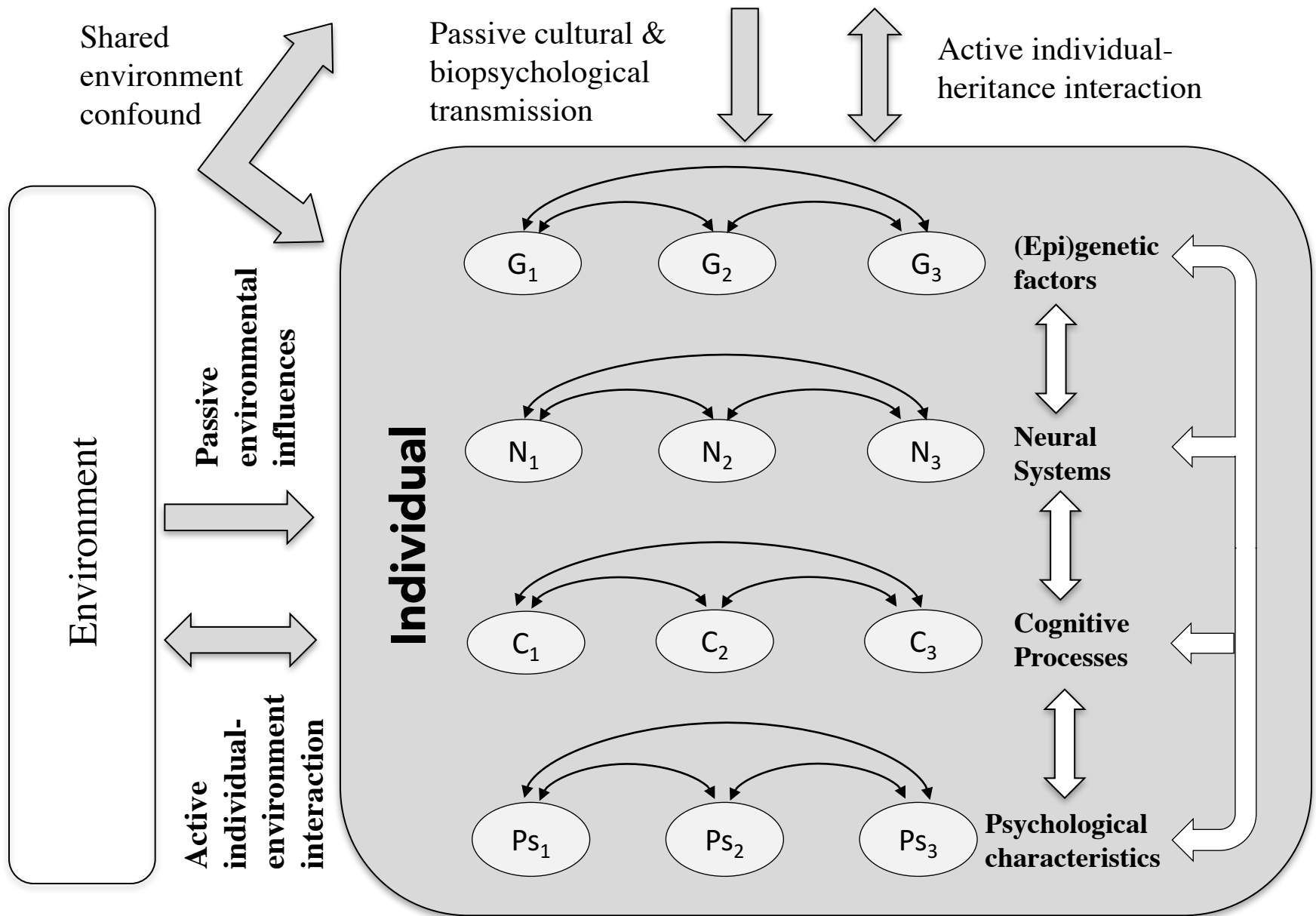
Reconsider the theory

Academic success is not only about reading



Parrila & McQuarrie, 2015

Genetic, epigenetic, linguistic and cultural heritage



What constitutes compensation?

How can we “teach” compensation?

- Increased risk for poorer GPA, drop-out, longer time to completion a consistent finding
 - Almost all slow
 - Many make oral reading errors that seem to change the meaning of the sentence
 - Some continue to struggle with comprehension that may not be at the level of other university students, in particular when tasks have a time limit
- BUT: A large majority do succeed in their studies
- How are these students succeeding in their studies if their reading skills are compromised?
- What contributes to academic success when reading skills compromised?
- What can we do to help?

Psychological characteristics (the second equifinality assumption)

- Learning strategies
 - Results not consistent and seem to depend on the measure (LASSI is not a good measure)
 - Maybe approach learning more “deeper” (better intrinsic motivation, use higher-order cognitive strategies, focus on understanding rather than memorizing)
- Persistence/grit/resilience
 - Comes out strongly in interviews, less so in formal assessments (resilience important for well-being but maybe less so for GPA)

Psychological characteristics continued

- In interviews, being highly motivated and maintaining a belief in one's abilities frequently mentioned as important
- In questionnaire studies, lower academic self-efficacy, higher levels of anxiety, concentration difficulties, and motivation problems often listed as comorbid to reading problems

Bergey, Deacon & Parrila, in press; Chevalier et al., in press; Corkett, Hein & Parrila, 2008
Corkett, Hein & Parrila, 2006; Kirby et al., 2008; Stack-Cutler, Parrila & Torppa, 2016

Environment

- Social relationships, and the available social capital in those relationships, matter
 - Emotional and social support; advising on planning, writing; study strategies, and goal setting
 - May have bigger effect on social integration than on academic achievement, but both informal and institutional relationships (e.g., academic advising) can impact the number of credits earned each year and the decision to drop-out

Bergey et al., revised and resubmitted;
Stack-Cutler, Parrila, Jokisaari & Nurmi, 2015
Stack-Cutler, Parrila & Torppa, 2016

Environment continued

- Environmental interventions can work
 - “Personalized outreach” is enough to increase the uptake of institutional services (services can impact the outcome)
 - A few sessions of “peer coaching” can reduce the decrease in academic self-efficacy that all studies show first-year students experiencing

Bergey et al., revised and resubmitted; Deacon et al., in press

Significant remaining questions

- All that we have asked!
- How do students with dyslexia/MD/LD/ADHD experience different post-secondary learning environments?
- What constitutes an accessible (equitable) learning environment for students with dyslexia?
 - Can we design learning environments (instruction and assessment in particular) to be accessible to all students?
 - Do we really need accommodations, or just better instructional design?

Thank you!
Questions?

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