Dyslexia and Giftedness

How Dyslexia Presents—
And Often Evades Detection—
In Some Of Our Brightest Students.

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Neurolearning.com / DyslexicAdvantage.ning.com
Dyslexia is Especially Hard for Many Parents and Professionals to Recognize in Highly Intelligent Children

Why is it so hard to see?
Reason #1: It Often Doesn’t Look Like We Might Expect…

Reading comprehension is not the gold standard for detecting or disproving dyslexia

- Reading Comprehension alone is a poor indicator of dyslexic processing style in very bright, verbally talented children
Giftedness Hides the Dyslexia, and Dyslexia Hides the Giftedness

• Giftedness Hides the Dyslexia
Gifted children with strong memory and problem solving abilities can compensate for some dyslexic challenges; he's able to read, how can he have dyslexia...

• Dyslexia Hides the Giftedness
Persisting challenges in spelling, writing, math, time awareness, organization, etc. make it harder for teachers and others to see students’ gifted abilities; look at her writing, are you sure she’s gifted?…

Misidentification so common among the gifted, we’ve given it its own name…
Stealth Dyslexia

—or—

How Dyslexia May Fly Under the Radar in Very Bright Children

Common Presentations

• Gifted program failure or struggles keeping up
• Underachievement relative to intelligence
• Work refusal, incompleteness, low motivation, inattention
• Writing and/or spelling problems, slow output
• “Carelessness,” “silly mistakes,” disorganization,
• Social or behavioral difficulties
• Anxiety, depression, or withdrawal
Common Screens for Dyslexia

Not Sensitive or Reliable in Gifted Children

• Reading Comprehension: Often in Superior range
• Common Tests of Phonological Awareness*
  May be Strong *(Nonsense words most sensitive, segmentation next best)
• Rapid Word Recall and Rapid Naming
• Working Memory
High IQ Changes How Dyslexia Presents

**Dyslexics, Non-Gifted**

- Good
- Impaired

**Gifted Dyslexic**

- Good
- Impaired
Why are these Tests Less Effective In Highly Intelligent Children?

These master problem-solvers can often “think their way around” both reading comprehension and many common tests of phonological awareness so reading challenges may appear minor or completely resolved.
Cognitive Strategies Used By Bright Dyslexic Students

- Analytical Ability and Inference
  (story comprehension > sentence > single word)
- Fill-in by Outside Knowledge, Verbal Closure
- Working Memory to ‘Play Back’ Information
- Use Other Strengths – Verbal Mediation, Kinesthetic Memory to Compensate for Visual Memory Weakness
Another Reason: High IQ Dyslexics Defy the “Matthew Effect”

Gifted Dyslexics

Surprising Verbal Strengths of High IQ Dyslexics
The Verbal Paradox of High IQ Dyslexics

Despite frequently displaying challenges with language-related functions like slow reading, poor spelling, and dysfluent oral and/or written expression:

- Most language functions not impaired
- Excellent verbal fund of knowledge
- Strong higher order language analysis and reasoning
- Many enjoy writing or creating stories
- Many are voracious readers (silent) or listeners
- Language scores often highest subtests on WISC, though language achievement testing may be weak.
Gifted Student Interests

- **Reading**
  - Gifted Dyslexics
  - Gifted Non-Dyslex

- **Writing**
  - Gifted Dyslexics
  - Gifted Non-Dyslex

- **Building**
  - Gifted Dyslexics
  - Gifted Non-Dyslex
So What Does Dyslexia Look Like In a Very Bright Child?
Sensitive Signs (>85%) of Dyslexia In High IQ Children

Sensitive

Gifted Dyslexics

Spelling, Read Aloud, Write Alphabet, Pseudoword Decoding
Adult Dyslexia Checklist (British Dyslexia Association)

- Do you visually confuse similar words such as cat and cot?
- Do you lose your place or miss out lines when reading?
- Do you confuse the names of objects, for example table for chair?
- Do you have trouble telling left from right?
- Is map reading or finding your way to a strange place confusing?
- Do you re-read paragraphs to understand them?
- Do you get confused when given several instructions at once?
- Do you make mistakes when taking down telephone messages?
- Do you find it difficult to find the right word to say?
- How often do you think of creative solutions to problems?
- How easy do you find it to sound out words such as e-le-phant?
- When writing, do you find it difficult to organize your thoughts on paper?
- Did you learn your multiplication tables easily?
- How easy do you find it to recite the alphabet?
- How hard do you find it to read aloud

Gifted Children with Dyslexia Often Look Like Adult Dyslexics
Typical Early Reading Pattern of Very Bright Dyslexics

• May struggle to learn alphabet or sounds, and will usually struggle to master phonics and decoding.
• Don’t ‘get’ Dr. Seuss, mispronounce words, wild guesses.
• Subsequent neglect of phonics and true decoding strategies with reliance on context and “guess-and-go”.
• Trouble decoding new words, poorly contextual or confusingly written (or syntactically dense) passages, poor fluency (speed and accuracy) and oral reading.
• Sudden “Aha!” moment (typically between late first and third grade, but in some children even later) that words can be memorized by appearance, with rapid progress thereafter in reading comprehension.
Highly Intelligent Dyslexic Children: Other Early Problems

- Letter formation/Handwriting / Spatial Orientation
- Auditory Processing and Listening
- Spelling and Conventions
- Rote, sequential, “automatic” memory, multi-tasking (math, taking notes)
- Attention (Auditory, Visual, Difficult Tasks)
- Visual difficulties with near work, endurance, headaches
- Self-Concept
Writing Problems of Young Dyslexics

Most shift from phonological to orthographic errors with development.

Porter, a very bright 9-year-old boy with a verbal IQ of nearly 140 described the above picture in the following way:

“The bay sole the cookie Jar. the Gul Push the bay. The mam fooeded the hane.”
Highly Intelligent Dyslexic Children
Later Problems

• Writing and Spelling
• Work and Reading Speed/Fluency
• Organization/Attention
• Oral Expression
High IQ Dyslexics Reading

• Reading Problems more subtle
• Adequate or even strong silent reading comprehension—especially of longer, context-rich passages.
• Difficulty with reading fluency: accuracy and speed.
• May struggle to read short, poorly contextual passages (e.g., test questions, answers, or instructions).
• Usually residual oral reading deficits (“guess and go”, word or line skips), problems decoding new words (or pseudowords).

e.g., the Gray Oral Reading Test from one of our subjects is typical:
• Rate: 5%
• Fluency: 9%
• Comprehension: 75%
High IQ Dyslexics Writing

- Poor expressive spelling, though may recognize correctly spelled words well enough to score adequately on standardized tests of spelling recognition, and may remember well enough for spelling tests.

- Usually messy or slow handwriting (cursive often especially hard).

- Each of the children whose writing samples we’ll show in a moment reached at least 6th grade without being diagnosed with dyslexia, or being given help for learning challenges.

- Not surprisingly, appropriate educational placement is often an issue.
Kids stealing cookies, accedants about to haten. The mother is not aware. Dads out. The mom is clearly some wer els. she gona ned a mop. I think this can be clarafide as adi...

"Kids stealing cookies, accedants adout to haten. The mother is not aware. Dads out. The mom is clearly some wer els. shye gona ned a mop. I think this can be clarafide as adi..."

16 y.o. gifted male college student, SBLM>150, grades in most recent semester, A, A, B.
"We've got kids stealing cookies and water overflowing from the sink. It appears that Dad is not home and the mom is clearly distracted, and it looks like the kid is about to fall off the stool. This family is clearly very dysfunctional. It looks like they own a fairly big house. That driveway stretches on a long way."
NONSENSE/PSEUDOWORD READING
Assesses Mastery of Common Phonics Rules

“I try to memorize what words look like so I don’t have to sound them out.” --13 yo gifted boy with dyslexia

• squive: skwerve/squivvey
• kelb: kwelb/kleb
• schnapp: suchkwakannap/sachannap

Affects new vocabulary (e.g. Science), proper names in literature, place names in geography, discovery of new words through reading
"I am a Typhoon and I am on my way to Japan and gathering speed. I might be the Typhoon that destroys the mongols and their ships on their second invasion of Japan.... My strongest power is wind which can make tremendous waves that can capsize even the strongest mongol ship."

12 y.o. boy, VIQ > 130
Visual & Sound-Based Errors with Read Aloud

Word and line skips, substitutions, elisions, additions:

• are about to become/will soon be
• poison/poisons, sea/seas, chemicals/chemical,
  liquid/liquids
• gave her/gather
• Mary/May
• microscopic/microsoftic
• endangered/elder aged,
• tolerance/tole-ace,
• most of the time their/most of their

Most of these children were not previously identified as having a reading problem because of strong silent comprehension.
IMPAIRED WRITTEN ALPHABET: Surprising Sensitivity

Omissions, substitutions, malformations, reversals, slow, sequence.

10 y.o. boy
SBLM 172

11 y.o. boy
VIQ 137

16 y.o. boy
SBLM > 150
Residual Dyslexic Challenges May Cause Trouble at Higher Levels of Education

- Need for Extended Time on College Entrance exams (greater demand for non-contextual reading, passages may be dense, speed matters)
- Core courses – quantity of reading and writing, time management
- TA’ing – strong in discussion groups, but weak writing by hand, embarrassed by spelling errors “Back in a minuet.”
- Reading to Learn – problems sounding out and remembering new words
- Grad school exams, Medical Boards, silly mistakes.

Imposter Syndrome
Goal: Keep Options Open
Reason 2: Mistaken Expectations Due In Part To Inadequate Definitions of Dyslexia

Plato: “‘Man’ can be defined as ‘a featherless biped.”’

Diogenes: “Behold, man, the featherless biped!”
NIH (NICHD) Definition
Also Adopted by IDA

- Dyslexia is a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.”
Dyslexia: Beyond the Printed Page

From so many perspectives, having a dyslexic processing style involves much more than just challenges with literacy skills, whether that perspective is:

-- Educational

-- Neurological, or

-- Cognitive
The Educational Perspective: Non-Reading, School-Related Challenges in Dyslexia

- Handwriting, spelling, and other “automatic” skills
- Oral language (retrieval, organization, expressive fluency)
- Rote memory
- Sequences, Procedures, Rules, Multi-Stepped Commands
- Orientation to time, pacing
- Right-left orientation
- Auditory processing (mishearing, background noise)
- Visual processing (Reading, Near-Work, Accomodation)
- Classroom attention and organization.
- Secondary social and emotional issues (self-esteem, anxiety, depression, etc.)
The Neurological Perspective: Brain Findings in Individuals With Dyslexic Processing Styles

By Brain Structure:
• Inefficient Cerebellar Processing
• More Diffuse Distribution of Brain Functions
• Slow/Inefficient White Matter Connections (Inter-Hemispheric and Inter-Lobar Communication)
• Weak/Mixed/Incomplete Hemispheric Dominance
Neurologic Findings in Individuals With Dyslexic Processing Styles

- Phonological Processing Challenges (distinguishing the sounds in words)
- Visual Processing Issues (seeing the letters in words, scanning lines of text, near vision)
- Motor Coordination, motor planning
The Cognitive Perspective: Cognitive Differences in Individuals With Dyslexic Processing Styles

Delayed Development of Fluency/Automaticity

- Weakness in Developing Automatic/Rote/Rule-Based Skills (Handwriting, Conventions, Phonics, Spelling Math Facts, Lists, etc.)
- Slow Processing Speed in Many Complex Tasks, including various aspects of auditory and visual and sensory-motor processing used in reading, writing, etc.
- Special difficulty with tasks that require sharing information between the two sides or between different lobes of the brain
- “Late-Blooming” profile of academic/cognitive growth
The Cognitive Perspective II

Differences in Memory Functions and Attention

• Relative Weakness in Procedural versus Declarative Memory
• Relative Weakness in Abstract/Semantic Verbal Memory (Definitions/Concepts in words), with relatively much stronger Personal Memory
• Stronger Implicit/Non-Verbal than Explicit/Verbal Learning (Often know more than they can say)
• Problems with Sequencing and Time Awareness
• Focusing, Dividing, or Alternating Attention

One Key Result of Cognitive Differences:
Need for “conscious compensation,” with resulting working memory overload.
With Bright Students Especially, A Broader And More Dynamic Understanding Of Dyslexia Is Needed

Dyslexia/= Just A Reading Disorder

• For bright children with dyslexia, reading comprehension is typically not the biggest challenge.
• The core essence of dyslexia is not a functional problem with reading or spelling, but differences in brain organization and sensory and information processing pathways that underlie these functional problems and also the special strengths that are also typically a part of the dyslexic profile.
Toward a New Definition of Dyslexia

- **Differences Extending Far Beyond Literacy**
- **Familial**
  - Inherited
  - Polygenic (multiple genes), “Spectrum” characteristics.
- **Developmental**
  - Manifestations may be very different at different ages.
  - Development very often late blooming
- **Beneficial**
  - A recognizable talent set often accompanies the challenges
  - Dyslexic children—and especially gifted dyslexic children—deserve to be recognized as excellent versions of what they are rather than defective versions of something they were never meant to be.
Familial

Seeing Ahead By Looking Back: Family History

Parents of High IQ Dyslexics
(Fathers and Mothers)

Engineering, Computers, Science 43%
Entrepreneurship, Sales 25%
Other 4%

Pilot, Coach, Artist, Counselor, Veterinarian, Optometrist,
(Other: Architecture, Construction, Furniture Making,
Accounting, Business Consulting, Poetry, Film, Comparative
Literature, Law Medicine [Surgery, Radiology, Dermatology,
Family Practice])

--Family history of dyslexia, dysgraphia, or late blooming,
Understanding How Family Members Develop Is **Critical** Because Late Bloomers Run in Packs

You’ll never really understand the Beav until you also know Ward, June, and Wally.
Late Blooming:
Many of the Brain Regions Important in Dyslexia
Are among the Latest Developing
Like the Frontal and Parietal-Temporal Regions
Long Growth Period for Cerebellum
Special Skill Sets in Individuals With Dyslexia

- Pattern recognition
- Complex data sets
- Innovation
- “Negative Space Thinking” (What’s missing)
- Analogy/Metaphor
- Personal Memory
- “Personalization” of abstract problems
- Non-Verbal/Intuitive Reasoning
- Spatial Reasoning and Building
Reputable studies have shown that dyslexic individuals are represented in at least twice their incidence in the population in such complex fields as:

- engineering
- astrophysics
- art
- computer graphics
- entrepreneurship
Dyslexia: The **MIND** Abilities

- **Material and Mechanical Reasoning**
- **Iconic (Symbolic) Thinking**
- **Narrative (Personal) Thinking**
- **Dynamic Systems (Verbal and Non-Verbal) Reasoning**

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Areas Where Very Bright Dyslexic Children *Excel* on our Testing

- Picture Description
- Narrative/Personal Memory
- Ambiguous Sentences
- “Lock and Key” (3D spatial task involving rotation)
Picture Description / Personal Narrative

• More often see picture as merely one scene in an ongoing narrative.
• More often imagine events not pictured that can harmonize and make sense of the events seen.
• More often personalize the narrative, using voices, naming characters, or placing self in the picture.
Personal/Narrative Memory

• Many of the dyslexic children we see also differ dramatically in their ability to remember paragraphs recounting “personal” or narrative details, compared with abstract or decontextualized details.

• Their memory for narrative material is often outstanding, even in children who struggle with working memory.
Ambiguous Sentences

• “She wants to find out how that fish smells.”
• “The boy hoped the bird would be free.”
• “The woman saw a man eating fish.”
• “The man looked for the mouse in his pajamas.”
• “He fed her dog biscuits.”
• “It is too hot to eat.”
Dyslexic children—and especially older dyslexic children—often perform very well on tests of spatial ability (e.g., lock-and-key, impossible figures)—important difference in 3D v. 2D.
Spatial Abilities

Gifted Student Interests

- Reading
- Writing
- Building

Percentage

Gifted Dyslexics
Gifted Non-Dyslexic
Not Just a Problem

- Schwablearning website
- Wolf, *Proust and the Squid*
- Shaywitz, *Overcoming Dyslexia*

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Best Interventions to Help Gifted Dyslexic Students

- Phonics (segmentation, discrimination): the challenge, getting children to go back
- Reading fluency practice!
- Spelling
- Accommodations: Keyboard, Write Outloud, Oral alternatives
- Mnemonic aids for personal memory
- Visual therapy when appropriate (*Fixing My Gaze*)
- Focus on Strengths: Understand what adult dyslexics are like; understand the adult job market (*Inc., Fast Company*). Mentorship programs.
- Focus on things they do well and enjoy.
"I am a Typhoon and I am on my way to Japan and gathering speed. I mite be the Typhoon that destrois the mongls and their ships on their second invashon of Japan.... My strongest power is wind wich can make trumendus waves that can capsise the strongest mongl ship."

Gifted Dyslexic Boy

Before Using “Write Outloud” Software
Author of “Mongl Invashon” after 2 years of “Write Outloud”

This small story is about a Beekeeper named Sue Hubbell and her bees. The story starts when Sue receives an exasperated report from a local farmer that her bees are loose in his milking shed. But when Sue arrives she finds that the little black and yellow things flying around are not bees but flies. She comes to this conclusion because the thing that she notices are two wings of a Diptera, bees have four wings or Hymenoptera. The next time

With Constant Feedback, Student Internalized Spelling Patterns
Using Color, Picture, and Auditory Memory in Dyslexia

- Personal/Story Memory
- Picture, Color, Pattern

- Moms always dish up eats
- Maids always ignore dusting
Math Memory

9 x 9 = 81

- Multiplication.com
- Multiplication in Minutes
- Addition the Fun Way
Working Memory Enhancement

- Cogmed
- Brainware Safari
How To Think About Dyslexia In Very Bright Children: Alternative, Not Simply Remedative, Education

- Problem with the purely remediative education model: These children aren’t simply failing to develop along the “normal” pathway in a way that’s diseased, disordered, or delayed: they’re developing along a different pathway that’s normal for them.

- This pathway may predispose them to special success in a variety of adult pursuits, but it typically requires different approaches to learning to read, write, spell, etc., and different expectations regarding the time course for acquisition of these skills.
Conventional School Often Hard for High IQ Dyslexics

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<th></th>
<th>High IQ Dyslexics</th>
<th>High IQ Non-Dyslexics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public School</td>
<td>13%</td>
<td>67%</td>
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<tr>
<td>Priv / Alt School</td>
<td>20%</td>
<td>13%</td>
</tr>
<tr>
<td>Homeschool</td>
<td>53%</td>
<td>20%</td>
</tr>
<tr>
<td>Community College</td>
<td>13%</td>
<td>0%</td>
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*High IQ dyslexic children are particularly likely to struggle in conventional educational settings, since both the special nature of their gifts and their challenges often go unrecognized.*
For Very Bright Children With Dyslexia, the Theme Song Is Definitely: “Time Is On My Side”

- Misapplying the notion of a “critical period” creates a sense of desperation that’s ultimately counterproductive. Most children are not going to irretrievably “miss the boat” and be left on the dock. Ships keep coming, but undue worry can lead children to abandon the idea of getting on board.
- Early attention to challenges is important, but avoid undue anxiety to “catch up to peers.” Dyslexia represents a different developmental pathway rather than a defect in brain function.
- Alternative, not simply remediative, education.
- Undue pressure and concern can create adjustment reactions (anxiety, opposition, aggression, self-doubt) that persist even after the learning challenges have been mastered.
- College may come later, and take longer.
Dyslexia: Definitely *Not* One Size Fits All

- Different manifestations depending upon combination of weaknesses and strengths.
- Different interventions needed depending upon combination of weaknesses and strengths.
When to suspect Dyslexia in a Very Bright Child

• Verbally skilled children *nearly always* want to read in the absence of underlying problems.
• If *oral* reading level or choice of reading materials doesn’t match verbal ability or cognitive/interest level, there’s usually a problem.
• Dysgraphia with poor spelling in a child with very strong oral language abilities will usually be dyslexic.
• Very bright children with unexpected problems with reading, writing, or spelling *always* require a comprehensive evaluation that looks at auditory, visual, sensory-motor, language, and memory functions, because appropriate intervention requires accurate assessment.
• Especially when family history of dyslexia, late-blooming, “smart but not scholarly.”
The Mislabeled Child

Brock Eide M.D. M.A. and Fernette Eide M.D.

http://Dyslexicadvantage.ning.com

“The Mislabeled Child represents a significant step toward a rethinking of our understanding of struggling children. It…will enable us to customize education and parenting for children whose minds work differently from most!”

--Mel D. Levine, M.D., Author A Mind at a Time