

AS YOU FLY LEARNING

Research Guide: Dyslexia, ADHD & Behavioral Challenges That Affect School

Evidence-informed background for parent education, website content, tutoring practices, and school-support conversations.

Prepared September 2026

IMPORTANT SCOPE NOTE

This document is educational. It does not diagnose dyslexia, ADHD, ODD, Conduct Disorder, DMDD, Emotional Disability/Disturbance, or any other condition. School eligibility under IDEA is also different from a medical or mental-health diagnosis.

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This guide began with information from the uploaded Learning Lab presentation (especially pages 12-17 and the reference list on page 34) and expands it using current government, university, and peer-reviewed research.

How to read the evidence

- **Prevalence** depends on how a condition is defined, measured, and sampled. Different high-quality sources can report different percentages without one necessarily being wrong.
- **Group-level brain differences** are not individual diagnostic tests. Neuroimaging can reveal average patterns while still showing substantial overlap between people.
- **Heritability** is a population statistic. It does not mean that a given percentage of one person's condition was caused by genes.
- **Association does not prove causation.** When two difficulties occur together, multiple pathways may explain the relationship.
- **Evidence-informed education** combines research findings with individualized assessment, progress monitoring, family context, and professional judgment.

PART I - DYSLEXIA

1. What dyslexia is

The International Dyslexia Association updated its definition in 2025. In current scientific terms, dyslexia is a specific learning disability involving persistent difficulty with word reading and/or spelling, particularly accuracy, speed, or both. Severity exists on a continuum. Causes are complex and reflect interacting genetic, neurobiological, and environmental influences. Phonological and morphological processing weaknesses are common, but not universal. [D1]

WEBSITE-READY TAKEAWAY

Dyslexia is not a problem with intelligence or motivation. It is a learning disability that can make accurate, automatic word reading and spelling much harder, even when a child has strong reasoning, knowledge, creativity, or oral language.

2. How common is dyslexia?

~7.1%

Pooled prevalence in a 2022 worldwide meta-analysis of primary-school children using study-specific diagnostic criteria. [D2]

~20%

A broader figure commonly used by the Yale Center for Dyslexia & Creativity for the dyslexia spectrum. [D3]

Continuum

The 2025 IDA definition explicitly describes dyslexia as varying along a continuum of severity. [D1]

Different prevalence estimates are expected. Studies use different thresholds, languages, sampling methods, and definitions. A stricter diagnostic cutoff will identify fewer children than a broader estimate of

3. Reading is not one skill

The National Reading Panel synthesized evidence across major areas of reading instruction and organized the research around phonemic awareness, phonics, fluency, vocabulary, and text comprehension. [D4] These components interact. A learner may understand sophisticated ideas when listening but struggle to decode the same words independently.

Finding	What it means
Phonemic awareness	Hearing and manipulating individual speech sounds, such as separating cat into /k/ /a/ /t/.
Phonics	Connecting speech sounds to letters and spelling patterns so unfamiliar words can be decoded.
Fluency	Reading accurately and automatically enough that attention can shift toward meaning rather than word-by-word effort.
Vocabulary	Knowing word meanings and how words are used in language.
Comprehension	Building meaning from text by connecting words, sentences, knowledge, and ideas.

WHY THIS MATTERS IN TUTORING

"Struggles with reading" is not specific enough to guide instruction. Effective support asks where the breakdown is occurring and teaches that component explicitly.

4. The science of phonemic awareness and phonics

The National Reading Panel found that explicit phonemic-awareness instruction can improve phonemic awareness, reading, and spelling, and that systematic phonics instruction produces meaningful benefits for early readers and many struggling readers. [D4][D5] Systematic means skills are intentionally sequenced and cumulative rather than taught randomly.

Phonics is not the entire reading curriculum. Decoding instruction should operate alongside fluency, vocabulary, knowledge building, language comprehension, and text comprehension. The strongest scientific framing is not "phonics versus comprehension," but the development of both word-reading skill and language comprehension.

5. Dyslexia and intelligence

Longitudinal Yale research showed that reading development and IQ tend to track together in typical readers but can diverge in dyslexic readers. This supports the long-standing concept of dyslexia as an

6. What brain imaging tells us

Reading depends on distributed brain systems, especially left-hemisphere networks that support speech-sound processing, visual word recognition, language, and efficient mapping between print and speech. A meta-analysis of 28 functional neuroimaging studies found a consistent pattern of reduced reading-related activation in the left occipitotemporal cortex among dyslexic readers, while also showing differences related to writing system and task. [D7]

These findings support a neurobiological basis for dyslexia, but they do not mean there is one "dyslexia spot" in the brain. Brain networks are distributed, and individual patterns vary.

IMPORTANT DIAGNOSTIC LIMITATION

An MRI or fMRI cannot currently diagnose dyslexia in one child. Brain-imaging findings are most useful for understanding group-level mechanisms, not replacing educational or psychological assessment.

7. Genetics and dyslexia

Dyslexia runs in families and is substantially heritable. A genome-wide study described conventional heritability estimates of roughly 40-60%, while other reviews have reported estimates that can be higher depending on the reading trait and study design. [D8][D9] Dyslexia is polygenic: many genetic variants appear to contribute small effects rather than one "dyslexia gene."

Heritability does not mean a child's outcome is fixed. Reading development reflects the interaction of biology, language development, instruction, opportunity, and experience.

8. Intervention and neuroplasticity

Reading instruction can be accompanied by changes in brain activation, connectivity, and structure. A 2021 systematic review of 39 neuroimaging studies found evidence of distributed brain changes after reading intervention, but no single universal "normalization" pattern emerged across studies. [D10] Earlier reviews also found intervention-related changes across multiple reading and language regions. [D11]

USE CAREFULLY

It is reasonable to say that learning changes the brain. It is too simplistic to say that one program "rewires the dyslexic brain to normal."

9. Early identification and intervention

A Yale longitudinal study followed 414 participants from first through twelfth grade and found that the reading achievement gap between dyslexic and typical readers was already apparent in first grade and did not simply disappear with age. [D12]

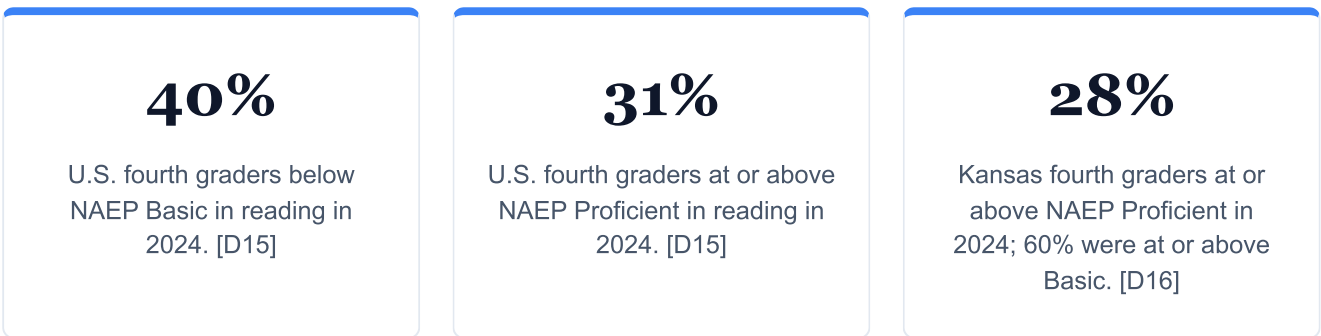
A separate intervention study found that children receiving a multi-component reading intervention in first or second grade made almost twice the gain, relative to controls, on foundational word-reading measures as children who began in third grade. [D13] This supports acting early rather than waiting for repeated

10. Orton-Gillingham: how to describe the evidence accurately

Orton-Gillingham is an influential approach that emphasizes direct, explicit, structured, sequential, diagnostic, and often multisensory teaching. However, a 2021 meta-analysis found that the available Orton-Gillingham-specific research did not demonstrate statistically significant superiority on foundational reading outcomes, while average effects favored the approach and the authors called for larger, higher-quality studies. [D14]

For a public website, it is stronger to emphasize evidence-supported instructional features — explicit, systematic, cumulative, diagnostic, responsive instruction — rather than claim that Orton-Gillingham has been proven to be the single best method.

11. Current literacy statistics



NAEP explicitly cautions that "Proficient" should not be treated as the same thing as being "at grade level." For Kansas, 60% at or above Basic means about 40% were below Basic in 2024. [D16]

Adult literacy also provides context: in the 2023 U.S. PIAAC assessment, 28% of adults ages 16-65 performed at Level 1 or below in literacy, up from 19% in 2017. [D17] This is a population literacy statistic, not a dyslexia prevalence statistic.

12. Secondary consequences and emotional impact

The 2025 IDA definition recognizes that persistent reading and spelling difficulty can reduce reading and writing experience and can affect comprehension, language and knowledge growth, written expression, academic achievement, psychological well-being, and employment opportunities. [D1]

Students who repeatedly experience difficulty may begin to avoid tasks, joke, shut down, become angry, or say they do not care. Those behaviors can be misread as laziness or lack of motivation. The behavior does not prove dyslexia, but the possibility of an underlying academic skill gap should be considered before adults assume intentional noncompliance.

13. Dyslexia can overlap with other conditions

Dyslexia can co-occur with ADHD, language disorders, dyscalculia, developmental coordination difficulties, anxiety, and other developmental or mental-health conditions. Overlap does not mean the conditions are identical. It means assessment and intervention may need to address more than one pathway at the same time.

Dyslexia - key statistics for public education

Finding	What it means
~7.1%	Pooled worldwide primary-school prevalence in a 2022 meta-analysis using study-specific criteria. [D2]
~20%	Broader estimate commonly used by Yale for the dyslexia spectrum. [D3]
40-60%	Commonly cited conventional heritability range in genetic research; not a percentage "caused by genes" in one person. [D8]
414 students	Yale longitudinal cohort showing the reading gap was present by first grade and persisted through adolescence. [D12]
40%	U.S. Grade 4 students below NAEP Basic in reading in 2024. [D15]
28%	U.S. adults ages 16-65 at PIAAC Level 1 or below in literacy in 2023. [D17]

PART II - ADHD

1. ADHD is a neurodevelopmental disorder

ADHD is a neurodevelopmental disorder characterized by developmentally inappropriate patterns of inattention and/or hyperactivity-impulsivity that impair functioning. Symptoms begin during development, occur across more than one context, persist over time, and are not explained better by another condition. There are predominantly inattentive, predominantly hyperactive-impulsive, and combined presentations, and presentation can change over time. [A1][A2]

WEBSITE-READY TAKEAWAY

ADHD is not simply a short attention span. It can affect regulation of attention, activity, impulses, motivation, emotion, working memory, organization, and consistent performance.

2. How common is ADHD?

11.7%

Estimated U.S. children ages 3-17 with a current parent-reported ADHD diagnosis in 2024 - about 7 million children. [A3]

5.9%

Meta-analytic estimate of youth meeting diagnostic criteria in international research summarized by the World Federation of ADHD. [A4]

2.5%

Commonly cited meta-analytic estimate of adult ADHD prevalence. [A4]

These figures use different methods. The 11.7% figure is current U.S. parent report of a professional diagnosis, whereas the 5.9% figure summarizes research samples applying diagnostic criteria. Different methods can produce different estimates without either number being inherently invalid.

3. ADHD is strongly heritable, but not caused by one gene

A major genetics review summarized ADHD heritability at about 74% across twin studies. Genome-wide research indicates that ADHD is highly polygenic: many common variants each contribute small amounts of risk, alongside rarer variants and environmental influences. [A5]

HERITABILITY REMINDER

A 74% heritability estimate does not mean that 74% of one child's ADHD was caused by genes. It describes variation across a population under the conditions studied.

4. What brain research shows

Large neuroimaging studies find small average differences in brain structure and function between groups with and without ADHD. A 2024 NIH study analyzed more than 10,000 functional brain images from more than 8,000 youth and linked ADHD symptoms with atypical interactions between frontal cortex and deeper brain regions involved in attention, learning, movement, reward, and information processing. [A6]

The best scientific model is a network model, not a "broken frontal lobe" model. Different circuits contribute to attention, inhibition, reward, motivation, movement, working memory, and emotion.

IMPORTANT DIAGNOSTIC LIMITATION

Brain imaging cannot currently diagnose ADHD in an individual. Group differences overlap too much to use MRI or fMRI as a clinical ADHD test. [A4]

5. ADHD is not simply "cannot focus"

A meta-analysis of 319 studies found greater reaction-time variability in people with ADHD than in typically

6. Hyperfocus: useful term, but not a diagnostic criterion

Some people with ADHD report episodes of intense absorption often called hyperfocus. Research supports that this experience can occur, but hyperfocus is not an official diagnostic symptom and is not unique to ADHD. It should not be used as proof that someone does or does not have ADHD.

7. Executive function

Executive functions are the processes used to hold information in mind, inhibit an immediate response, shift strategies, plan, organize, monitor performance, and work toward future goals. A meta-analysis of 83 studies found average ADHD-related weaknesses across executive-function tasks, with especially consistent differences in response inhibition, vigilance, working memory, and planning. [A8]

The same meta-analysis also showed why a simplistic "ADHD equals executive dysfunction" claim is inaccurate: executive-function weaknesses were not universal and were neither necessary nor sufficient to explain every case of ADHD.

8. Working memory in school

Working memory allows a student to hold information temporarily while using it. Multi-step directions, mental math, note-taking, sentence construction, and remembering where they are in an assignment can all place demands on working memory. A student can understand the academic concept but still lose information while trying to act on it.

PRACTICAL IMPLICATION

When working memory is the bottleneck, externalizing information can help: written directions, visual steps, checklists, worked examples, shorter instruction chunks, and quick checks for understanding.

9. Knowing how versus consistently doing it

One of the most important school distinctions is skill versus performance. A student may know how to organize a binder, solve a math problem, proofread, wait a turn, or turn in homework but fail to execute that skill consistently in the moment. Attention, inhibition, working memory, initiation, organization, and self-monitoring all influence whether knowledge is successfully translated into action.

WEBSITE-READY TAKEAWAY

Sometimes the question is not "Does this child know what to do?" It is "What support helps this child reliably access and use what they know?"

10. Motivation, reward, and delay

ADHD research includes differences in reward processing and delay-related decision-making. Immediate, concrete, predictable feedback can therefore be more effective than distant consequences for some learners. This does not mean students with ADHD cannot care about long-term goals; it means the

11. ADHD is not simply "low dopamine"

Dopamine and norepinephrine are important in ADHD neurobiology and in the effects of ADHD medications. However, a 2024 review of more than four decades of dopamine research concluded that the evidence supports dopamine involvement but provides limited support for reducing ADHD to a generalized hypodopaminergic, or "low dopamine," state. [A9]

USE CAREFULLY

Avoid saying "ADHD is caused by a dopamine deficiency." A more accurate explanation is that ADHD involves complex differences in brain signaling and network regulation, including dopamine and norepinephrine systems.

12. Movement and regulation

Hyperactivity and fidgeting should not automatically be interpreted as a lack of learning. Research continues to examine when movement may help regulate arousal or performance and when it interferes. The useful educational question is not "Is the child perfectly still?" but "Is the movement helping, neutral, or interfering with learning and safety?"

13. Emotional regulation

Emotional dysregulation is not required for an ADHD diagnosis, but it is common. A meta-analysis of 77 studies involving 32,044 youth found substantial average ADHD-related differences in emotional reactivity/lability and emotion-regulation measures. [A10]

For some children, frustration rises quickly and takes longer to resolve. This can make academic difficulty, correction, transitions, or peer conflict look disproportionately intense.

14. ADHD can significantly affect learning

ADHD is not itself a specific learning disability, but symptoms can disrupt access to instruction and consistent academic performance. A learner may miss parts of instruction, make impulsive errors, struggle with long tasks, lose completed work, have difficulty initiating assignments, or receive less practice because of incomplete work. A co-occurring learning disability can magnify these effects.

15. Co-occurring conditions are the rule more often than the exception

77.9%

Children with current ADHD who had at least one co-occurring disorder in the 2022 National Survey of Children's Health. [A11]

36.5%

Children with current ADHD who also had a reported learning disability in the 2022 study. [A12]

30.1%

Children with current ADHD who received neither ADHD medication nor behavioral ADHD treatment in 2022. [A11]

16. ADHD and girls

CDC data from 2022-2023 showed diagnosed ADHD in about 13% of boys and 7% of girls. [A3] A 2024 Lancet Psychiatry review notes that girls are less likely to be diagnosed during childhood, tend to receive diagnoses later, and are less likely to receive medication. Possible explanations include differences in presentation, diagnostic practices, compensatory behavior, and sociocultural factors. [A13]

WEBSITE-READY TAKEAWAY

ADHD does not have to be loud. A quiet student who daydreams, loses materials, forgets directions, takes hours to finish work, or becomes exhausted from compensating may still be significantly impaired.

17. Diagnosis requires more than a quiz

There is no single test for ADHD. Diagnosis depends on developmental history, symptoms, impairment, information across settings, and consideration of other explanations such as learning disorders, anxiety, sleep problems, depression, trauma, and other developmental conditions. Psychological tests and computerized attention tasks can provide information but are not diagnostic by themselves. [A2][A4]

18. Classroom supports have evidence

A meta-analysis of 100 classroom-intervention studies found that teacher-delivered antecedent strategies, consequence-based strategies, self-regulation approaches, and combinations could reduce off-task and disruptive behavior among students with ADHD symptoms. [A14] A separate meta-analysis of 19 randomized controlled trials involving more than 18,000 students found small but positive effects of behavioral classroom programs on disruptive and on-task behavior. [A15]

Evidence supports changing the environment and teaching skills rather than relying only on repeated verbal reminders to "focus" or "try harder."

19. Organization is teachable

A meta-analysis of 12 randomized controlled trials involving 1,054 children found that organizational-skills training improved parent- and teacher-rated organization and produced smaller positive effects on inattention and academic performance. [A16]

PRACTICAL IMPLICATION

"Be organized" is an expectation, not an instructional plan. Organization can be broken into visible routines: where work goes, how assignments are recorded, how materials are checked, and how a student verifies that a task is actually complete.

20. Treatment and educational support are different roles

ADHD treatment can include behavioral therapy, parent training, medication, school supports, and combinations of approaches depending on age and need. Tutoring does not diagnose or medically treat

ADHD - key statistics for public education

Finding	What it means
11.7%	U.S. children ages 3-17 with a current parent-reported ADHD diagnosis in 2024. [A3]
~74%	Average heritability estimate summarized across twin studies; a population statistic, not an individual causal percentage. [A5]
77.9%	Children with current ADHD with at least one co-occurring disorder in the 2022 national study. [A11]
36.5%	Children with current ADHD with a reported learning disability in the 2022 national study. [A12]
8,000+ youth	Participants represented in a 2024 NIH functional-connectivity study using more than 10,000 brain images. [A6]
1,054 children	Participants across 12 trials in an organizational-skills training meta-analysis. [A16]

PART III - BEHAVIORAL & EMOTIONAL CHALLENGES

1. Behavioral challenges are not a diagnosis

A student can argue, refuse work, leave class, shut down, threaten, hit, destroy materials, swear, lie, steal, or have explosive outbursts for many different reasons. The behavior itself does not identify the diagnosis or the function. CDC notes that some arguing, anger, aggression, and defiance occur in typical development; a behavior disorder is considered when patterns are unusual for age, persistent, severe, and impairing. [B1]

CORE PRINCIPLE

Behavior tells us that something is happening. It does not, by itself, tell us why.

2. How common are diagnosed behavior disorders?

~3-5%

U.S. children ages 3-17 with a current diagnosed behavior disorder in 2023-2024. [B2]

~3%

Estimated population prevalence of Oppositional Defiant Disorder in a 2023 major review. [B3]

8%

Pooled Conduct Disorder prevalence in a 2024 umbrella review of seven meta-analyses. [B4]

Prevalence varies with measurement method. Screening tools can produce very different estimates from structured diagnostic interviews, so public education should name the source and avoid treating one number as universal.

3. Emotional Disability/Emotional Disturbance under IDEA

Under the Individuals with Disabilities Education Act (IDEA), Emotional Disturbance is an educational eligibility category, not a psychiatric diagnosis. Federal criteria require one or more specified characteristics to be present over a long period and to a marked degree, with an adverse effect on educational performance. These characteristics include unexplained inability to learn, major relationship difficulty, inappropriate behavior or feelings, pervasive unhappiness/depression, or physical symptoms/fears associated with personal or school problems. [B5]

IDEA also states that a student is not identified as a "child with a disability" solely because a condition exists; the student must, by reason of the disability, need special education and related services. [B6]

4. Kansas terminology

Kansas law uses the term "Emotional Disability" and defines it as having the same meaning as the federal IDEA term "Emotional Disturbance." [B7] This is an important distinction for a Kansas-facing website: a mental-health diagnosis can inform evaluation, but it does not automatically determine IDEA eligibility.

5. How many students are served under Emotional Disturbance?

In school year 2022-23, 326,875 U.S. children and students ages 3-21 were served under IDEA under the Emotional Disturbance category. That was about 4.3% of students served under IDEA and approximately 0.7% of total enrollment. [B8]

INTERPRETATION

This does not mean only 0.7% of students experience serious emotional or behavioral difficulties. It means 0.7% of enrollment was served under this particular IDEA category. Other students may be served under a different category, a 504 plan, general education supports, or no formal plan.

6. Oppositional Defiant Disorder (ODD)

ODD is more than "does not listen." An occasional argument, refusal, stubborn response, or meltdown does not establish the diagnosis. Severity, duration, context, developmental expectations, and functional impairment matter.

7. Conduct Disorder (CD)

Conduct Disorder involves a persistent pattern of more serious rule violations and violations of the rights or safety of others, which can include aggression, deliberate property destruction, deceit or theft, and serious rule violations. [B1] It is not simply "more severe ODD," although some children with ODD later develop CD.

A 2024 umbrella review combining seven meta-analyses estimated pooled CD prevalence at about 3% in children and adolescents. [B4]

LANGUAGE MATTERS

Avoid labeling a child with CD as "bad," "dangerous," or "a future criminal." A diagnosis describes a pattern that requires assessment and treatment; it is not the child's identity or destiny.

8. DMDD and severe irritability

Disruptive Mood Dysregulation Disorder (DMDD) is characterized by persistent irritability or anger and recurrent severe temper outbursts. NIMH describes outbursts averaging three or more times per week, symptoms lasting at least 12 months, chronic irritability between outbursts, and impairment across settings. DMDD was added to DSM-5 in 2013, and NIMH notes that relatively few treatments have been studied specifically for DMDD. [B9]

A severe meltdown is not automatically CD or ODD. Intense outbursts can occur in ADHD, anxiety, autism, trauma-related conditions, language disorders, learning disabilities, DMDD, ODD, CD, and other conditions.

9. Brain science and disruptive behavior

Neuroimaging research suggests average differences in systems involved in reward processing, emotion, decision-making, and cognitive control among groups with disruptive behavior disorders. These are research findings at the group level, not diagnostic brain scans for individual students.

10. Executive function can contribute

A 2023 systematic review and meta-analysis of 50 studies found average executive-function weaknesses associated with ODD and CD, including working memory, inhibition, and cognitive flexibility. [B10] Not every student with disruptive behavior has executive dysfunction, but these processes can help explain why knowing a rule is not the same as using it under stress.

11. Emotion dysregulation and externalizing symptoms

A 2026 systematic review and meta-analysis of 75 studies involving 11,913 participants found a moderate

12. Reactive versus proactive aggression

Researchers often distinguish reactive aggression — impulsive aggression in response to frustration, provocation, or perceived threat — from proactive aggression used more deliberately to obtain a goal, status, object, or other outcome. These patterns can overlap, but they suggest different intervention targets.

A highly reactive student may need support with threat interpretation, early warning signs, frustration tolerance, regulation, and response delay. A more instrumental pattern may require close analysis of reinforcement, goals, social consequences, and alternative ways to obtain the same outcome.

13. Hostile attribution bias

A meta-analysis of 111 studies with more than 29,000 participants found a positive association between attributing hostile intent in ambiguous situations and children's aggressive behavior. [B12]

In practice, one student may interpret an accidental bump as an accident, while another immediately assumes it was intentional. Teaching students to pause, generate alternative explanations, and check evidence can address a cognitive step that occurs before retaliation.

14. Internalizing difficulties can look "behavioral"

School refusal, putting a head down, repeatedly visiting the nurse, avoiding presentations, leaving class, crying, or becoming angry when pushed can be labeled noncompliance even when anxiety is central. A 2022 systematic review found that anxiety was a prevalent factor associated with school refusal, including social, separation, school, state, and trait anxiety. [B13]

CORE PRINCIPLE

The same outward behavior can have different meanings. Refusal can be oppositional, but it can also reflect fear, confusion, overload, skill deficit, embarrassment, or escape from a task the student experiences as impossible.

15. Trauma can affect school behavior, but it should not become a catch-all explanation

Adverse and traumatic experiences can affect attention, learning, threat perception, emotion, sleep, relationships, and behavior. Trauma-informed support can therefore be valuable. However, aggression does not prove trauma, trauma does not prove Conduct Disorder, and not every difficult behavior should be attributed to trauma without evaluation.

16. Learning difficulty and behavior are connected

A 2024 meta-analysis of 33 studies found a statistically significant association between lower reading performance and higher externalizing behavior in children ages 5-12. [B14] The correlation was modest and does not establish which factor causes the other. It does, however, support the importance of checking academic skill when behavior repeatedly occurs around difficult schoolwork.

17. Functional Behavioral Assessment (FBA)

In 2024, the U.S. Department of Education issued guidance describing FBA as a process for understanding the function and purpose of a specific interfering behavior and the factors associated with its occurrence and non-occurrence. [B15] The guidance emphasizes clear behavioral definitions, direct and indirect data collection, analysis of antecedents and consequences, identification of function, and development of replacement skills.

Finding	What it means
Antecedent	What reliably happens before the behavior? Task demand, transition, peer interaction, correction, noise, waiting, loss of access, etc.
Behavior	What exactly does the student do? Define it in observable, measurable terms rather than labels such as "defiant."
Consequence	What happens immediately afterward? Attention, escape, delay, removal, access to an item/activity, sensory change, or another outcome.
Function	What outcome does the behavior reliably obtain or avoid? Common categories include attention, access, escape/avoidance, and sensory/stimulation functions.
Replacement skill	What safer, more appropriate behavior can meet the same need? Asking for help, requesting a break, using a communication strategy, or completing work with supports.

18. Function does not mean manipulation

When behavior is described as serving a function, that does not mean a child consciously planned the entire sequence. It means the behavior has a predictable relationship with what happens before and after it, and those consequences may strengthen or maintain the pattern over time.

19. Replacement behavior must work

If a student throws materials to escape work, simply saying "keep your hands to yourself" leaves the original need unresolved. A function-based plan may teach the student to request help, ask for a brief break, use a visual "stuck" card, or complete a reduced first step. The U.S. Department of Education guidance emphasizes teaching skills that address the same function as the interfering behavior. [B15]

20. Understanding does not eliminate accountability

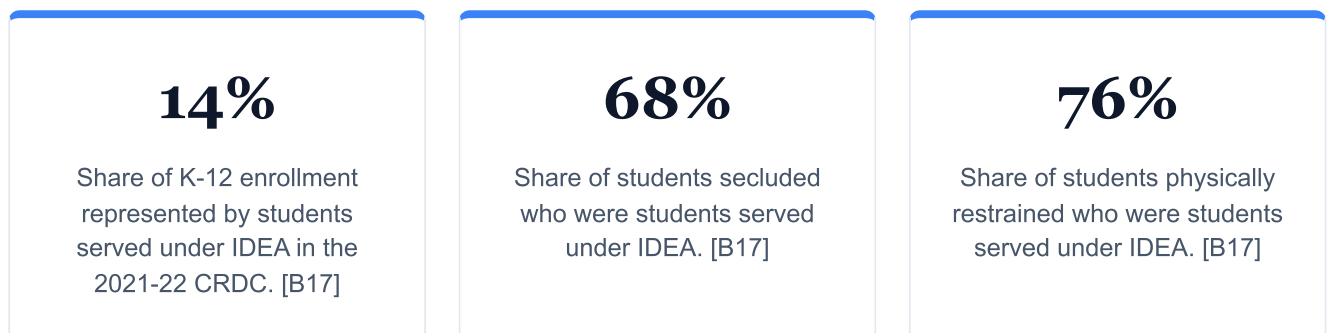
A function-based approach does not mean unsafe behavior is acceptable or that consequences never matter. A strong educational response can hold three ideas at the same time: understand why the behavior occurred, maintain a clear safety boundary, and teach a more effective replacement behavior.

21. Behavior skills can be explicitly taught

The What Works Clearinghouse 2024 K-5 practice guide found strong evidence for co-establishing/modeling/teaching clear behavioral expectations, reminding students of expected behavior before situations occur, and acknowledging expected behavior through positive attention, praise, and rewards. It found moderate evidence for offering appropriate instructional choices. [B16]

"Make better choices" is not instruction unless the student has been explicitly taught what the alternative choice looks like, when to use it, and how to access it during stress.

22. Restraint and seclusion data



The U.S. Department of Education states that it is not aware of evidence-based support for restraint or seclusion as effective strategies for modifying disability-related behavior and maintains that they should not be used as punishment or discipline; its guidance limits their use to situations involving imminent danger of serious physical harm. [B18]

23. Parent training and multi-setting treatment

CDC describes behavior-management training for parents as the treatment with the strongest evidence for younger children with disruptive behavior disorders. For school-age children and adolescents, effective treatment often involves the child, family, and school. [B1] This is more sophisticated than "parents need to discipline better"; evidence-based programs teach consistent reinforcement, effective directions, relationship skills, and predictable responses.

24. Serious conduct problems can improve

A 2023 meta-analysis of 60 treatment studies involving 9,405 children found that children with disruptive behavior disorders and elevated callous-unemotional traits still showed reductions in disruptive-behavior symptoms with treatment, even though they often began and ended treatment with greater severity than peers without those traits. [B19]

Higher risk is not the same as hopelessness. Public-facing language should avoid deterministic labels.

Behavioral & emotional challenges - key statistics

Finding	What it means
8%	U.S. children ages 3-17 with a current diagnosed behavior disorder in 2023-2024. [B2]
~3-5%	Estimated ODD prevalence from a 2023 major review. [B3]
~3%	Pooled Conduct Disorder prevalence from a 2024 umbrella review. [B4]
326,875	Children/students ages 3-21 served under IDEA Emotional Disturbance in 2022-23. [B8]
11,913	Participants in a 2026 meta-analysis linking emotion dysregulation and externalizing symptoms. [B11]
29,000+	Participants across 111 studies examining hostile-intent attribution and aggression. [B12]
68% / 76%	IDEA students' shares of students secluded / physically restrained in the 2021-22 CRDC. [B17]

PART IV - CROSS-CUTTING PRINCIPLES

For school and tutoring support

1. Difficulty is not character

Across dyslexia, ADHD, and behavioral/emotional challenges, one of the most consistent risks is misinterpreting difficulty as character. Slow reading is not low intelligence. Inconsistent performance is not proof of laziness. Avoidance is not automatically defiance. Aggression is not a complete explanation of why aggression occurred.

2. Skill and performance are different questions

Ask both: "Does the student know the skill?" and "Can the student access the skill under the demands of the real situation?" A learner may possess knowledge but lose access when working memory, attention, emotion, language, task difficulty, or social stress overwhelms the system.

3. Start with observable descriptions

Terms such as lazy, manipulative, disrespectful, careless, unmotivated, and attention-seeking are interpretations. Strong problem solving begins with observable descriptions: "left seat four times during ten

4. Match the intervention to the mechanism

Finding	What it means
Word-reading deficit	Explicit instruction in the missing reading skill; do not rely only on more independent reading practice.
Working-memory overload	Reduce unnecessary memory load; externalize directions and steps.
Task initiation	Use clear start cues, visible first steps, brief work intervals, and immediate feedback.
Escape from difficult work	Adjust task accessibility and teach an appropriate help/break request that still returns the student to learning.
Peer-attention behavior	Teach an appropriate way to gain peer attention and alter the reinforcement pattern around disruptive behavior.
Reactive aggression	Teach regulation, threat interpretation, pause routines, and safe conflict responses while maintaining safety limits.
Anxiety-driven refusal	Address fear and avoidance rather than treating the behavior as simple noncompliance.

5. Accommodations and supports are access tools

A support should reduce a barrier that is not the skill being measured or should help a learner access instruction while necessary skills are still developing. The goal is not to remove all challenge. The goal is to make the intended challenge accessible and to teach independence gradually.

6. "More effort" is not a complete intervention

When a child is already working near capacity, repeated demands to try harder can increase frustration without improving the underlying skill. Effective intervention identifies what is missing, changes the task or environment when appropriate, teaches the needed skill, and measures whether the student is actually improving.

7. Safety and compassion can coexist

Understanding a student's disability, emotional state, history, or behavioral function does not require adults to permit unsafe behavior. Effective support can be compassionate, specific, predictable, and firm at the same time.

PART V - RESOURCES & REFERENCES

The references below are grouped by topic. Government and major institutional sources are listed alongside peer-reviewed meta-analyses and reviews. URLs are included so this PDF can also function as a research trail for future website writing.

Source presentation

[P1] Learning Lab Presentation, uploaded by the user. Relevant material: pages 12-17 and references on page 34. (Original presentation source; website link listed here only as the user's project site, not as the presentation's publication URL.)
<https://asyoufly.com>

Dyslexia and reading science

[D1] International Dyslexia Association. 2025 Definition of Dyslexia and explanation.
<https://dyslexiaida.org/explanation-2025-dyslexia-definition-explanation/>

[D2] Yang L, et al. Prevalence of Developmental Dyslexia in Primary School Children: A Systematic Review and Meta-Analysis.
<https://pubmed.ncbi.nlm.nih.gov/35204003/>

[D3] Yale Center for Dyslexia & Creativity. What is Dyslexia?/YCDC resources.
<https://www.dyslexia.yale.edu/dyslexia/what-is-dyslexia/>

[D4] NICHD. National Reading Panel Publications: phonemic awareness, phonics, fluency, vocabulary, and comprehension.
<https://www.nichd.nih.gov/about/org/der/branches/cdbb/nationalreadingpanelpubs>

[D5] NICHD. Report of the National Reading Panel - Findings.
<https://www.nichd.nih.gov/publications/pubs/nrp/findings>

[D6] Yale Center for Dyslexia & Creativity. Uncoupling of Reading and IQ Over Time.
<https://www.dyslexia.yale.edu/research-science/ycdc-research/uncoupling-of-reading-and-iq-over-time-empirical-evidence-for-a-definition-of-dyslexia/>

[D7] Martin A, et al. Dyslexic brain activation abnormalities in deep and shallow orthographies: meta-analysis of 28 functional neuroimaging studies.
<https://pubmed.ncbi.nlm.nih.gov/27061464/>

[D8] Gialluisi A, et al. Genome-wide association study reveals new insights into the heritability and genetic correlates of developmental dyslexia.
<https://pubmed.ncbi.nlm.nih.gov/33057169/>

[D9] Carrion-Castillo A, et al. Insights into Dyslexia Genetics Research from the Last Two Decades.
<https://pubmed.ncbi.nlm.nih.gov/35053771/>

[D10] Perdue MV, et al. Reading intervention and neuroplasticity: systematic review and meta-analysis of brain changes associated with reading intervention.

<https://pubmed.ncbi.nlm.nih.gov/34856223/>

[D11] Barquero LA, et al. Neuroimaging of reading intervention: systematic review and ALE meta-analysis.

<https://pubmed.ncbi.nlm.nih.gov/24427278/>

[D12] Yale Center for Dyslexia & Creativity. Achievement Gap in Reading Is Present as Early as First Grade and Persists through Adolescence.

<https://www.dyslexia.yale.edu/research-science/achievement-gap-in-reading-is-present-as-early-as-first-grade-and-persists-through-adolescence/>

[D13] Lovett MW, et al. Early intervention for children at risk for reading disabilities: impact of grade at intervention.

<https://pubmed.ncbi.nlm.nih.gov/35664550/>

[D14] Stevens EA, et al. Current State of the Evidence: Effects of Orton-Gillingham Reading Interventions.

<https://pubmed.ncbi.nlm.nih.gov/34629488/>

[D15] The Nation's Report Card. 2024 Reading National Results, Grade 4.

https://www.nationsreportcard.gov/reports/reading/2024/g4_8/national-trends/

[D16] NCES. 2024 Reading State Snapshot Report - Kansas, Grade 4.

<https://nces.ed.gov/nationsreportcard/subject/publications/stt2024/pdf/2024220KS4.pdf>

[D17] NCES. 2023 Program for the International Assessment of Adult Competencies (PIAAC) U.S. National Results.

https://nces.ed.gov/surveys/piaac/2023/national_results.asp

ADHD

[A1] National Institute of Mental Health. Attention-Deficit/Hyperactivity Disorder: What You Need to Know.

<https://www.nimh.nih.gov/health/publications/attention-deficit-hyperactivity-disorder-what-you-need-to-know>

[A2] CDC. Diagnosing ADHD/clinical overview.

<https://www.cdc.gov/adhd/diagnosis/index.html>

[A3] CDC. Data on ADHD in Children - 2024 estimates and 2022-2023 demographic data.

<https://www.cdc.gov/adhd/data/index.html>

[A4] Faraone SV, et al. World Federation of ADHD International Consensus Statement: 208 Evidence-based Conclusions.

<https://pmc.ncbi.nlm.nih.gov/articles/PMC8328933/>

[A5] Faraone SV, Larsson H. Genetics of attention deficit hyperactivity disorder.

<https://pubmed.ncbi.nlm.nih.gov/29892054/>

[A6] NIMH. NIH Researchers Identify Brain Connections Associated With ADHD in Youth (2024).

<https://www.nimh.nih.gov/news/science-updates/2024/nih-researchers-identify-brain-connections-associated-with-adhd-in-youth>

[A7] Kofler MJ, et al. Reaction time variability in ADHD: a meta-analytic review of 319 studies.

<https://pubmed.ncbi.nlm.nih.gov/23872284/>

[A8] Willcutt EG, et al. Validity of the executive function theory of ADHD: a meta-analytic review.

[A9] The dopamine hypothesis for ADHD: evaluation of evidence from human studies and animal models.
<https://pubmed.ncbi.nlm.nih.gov/39619336/>

[A10] Graziano PA, Garcia A. ADHD and children's emotion dysregulation: a meta-analysis.
<https://pubmed.ncbi.nlm.nih.gov/27180913/>

[A11] Danielson ML, et al. ADHD Prevalence Among U.S. Children and Adolescents in 2022: Diagnosis, Severity, Co-Occurring Disorders, and Treatment.
<https://stacks.cdc.gov/view/cdc/160350>

[A12] CDC ADHD data visualization/co-occurring conditions.
<https://www.cdc.gov/adhd/data/index.html>

[A13] Martin J. Why are females less likely to be diagnosed with ADHD in childhood than males? Lancet Psychiatry, 2024.
<https://pubmed.ncbi.nlm.nih.gov/38340761/>

[A14] Gaastra GF, et al. Classroom interventions for off-task and disruptive behavior in children with ADHD symptoms: meta-analytic review.
<https://pmc.ncbi.nlm.nih.gov/articles/PMC4757442/>

[A15] Veenman B, et al. Efficacy of behavioral classroom programs in primary school: meta-analysis of randomized controlled trials.
<https://pubmed.ncbi.nlm.nih.gov/30303966/>

[A16] Bikic A, et al. Meta-analysis of organizational skills interventions for children and adolescents with ADHD.
<https://pubmed.ncbi.nlm.nih.gov/28088557/>

Behavioral and emotional challenges / school behavior

[B1] CDC. Behavior or Conduct Problems in Children.
<https://www.cdc.gov/children-mental-health/about/about-behavior-or-conduct-problems-in-children.html>

[B2] CDC. Data and Statistics on Children's Mental Health - 2023-2024 data.
<https://www.cdc.gov/children-mental-health/data-research/index.html>

[B3] Hawes DJ, et al. Oppositional defiant disorder. Nature Reviews Disease Primers, 2023.
<https://pubmed.ncbi.nlm.nih.gov/37349322/>

[B4] Ayano G, et al. Umbrella Review of the Global Prevalence of Conduct Disorder in Children and Adolescents.
<https://pubmed.ncbi.nlm.nih.gov/37962781/>

[B5] U.S. Department of Education. IDEA Sec. 300.8(c)(4) - Emotional Disturbance definition.
<https://sites.ed.gov/idea/regs/b/a/300.8/c/4>

[B6] U.S. Department of Education. IDEA Sec. 300.8(a) - definition of a child with a disability and need for special education.
<https://sites.ed.gov/idea/regs/b/a/300.8/a>

[B7] Kansas Legislature. HB 2322/Emotional Disability terminology.
https://www.kslegislature.gov/...hb2322_enrolled.pdf

[B8] NCES. Children and students ages 3-21 served under IDEA, Part B, by type of disability: 2022-23

[B9] National Institute of Mental Health. Disruptive Mood Dysregulation Disorder: The Basics.
<https://www.nimh.nih.gov/health/publications/disruptive-mood-dysregulation-disorder>

[B10] Executive (dys)functions and ODD and CD: systematic review and meta-analysis.
<https://pubmed.ncbi.nlm.nih.gov/36442005/>

[B11] Njardvik U, et al. Emotion dysregulation in children and adolescents with externalizing disorders: systematic review and meta-analysis, 2026.
<https://pubmed.ncbi.nlm.nih.gov/42301280/>

[B12] Verhoef REJ, et al. Hostile Intent Attribution and Aggressive Behavior in Children Revisited: A Meta-Analysis.
<https://pubmed.ncbi.nlm.nih.gov/31165477/>

[B13] Tekin I, Aydin S. School refusal and anxiety among children and adolescents: systematic scoping review.
<https://pubmed.ncbi.nlm.nih.gov/36161758/>

[B14] Pickren SE, et al. The relation between reading and externalizing behavior: a correlational meta-analysis.
<https://pubmed.ncbi.nlm.nih.gov/38949745/>

[B15] U.S. Department of Education. Using Functional Behavioral Assessments to Create Supportive Learning Environments, November 2024.
<https://sites.ed.gov/...using-functional-behavioral-assessments...>

[B16] Institute of Education Sciences / What Works Clearinghouse. Teacher-Delivered Behavioral Interventions in Grades K-5, 2024.
<https://ies.ed.gov/ncee/WWC/PracticeGuide/31/Published>

[B17] U.S. Department of Education. 2021-22 Civil Rights Data Collection: First Look - restraint and seclusion data.
<https://www.ed.gov/media/document/2021-22-crdc-first-look-report>

[B18] U.S. Department of Education. Questions and Answers: Addressing the Needs of Children with Disabilities and IDEA's Discipline Provisions.
<https://sites.ed.gov/...qa-addressing-the-needs-of-children...>

[B19] Treatment of childhood disruptive behavior disorders and callous-unemotional traits: systematic review and two meta-analyses.
<https://pubmed.ncbi.nlm.nih.gov/36859562/>

Additional practical resource hubs

[R1] Center on PBIS - Positive Behavioral Interventions and Supports. <https://www.pbis.org/>

[R2] International Dyslexia Association. <https://dyslexiaida.org/>

[R3] Yale Center for Dyslexia & Creativity. <https://www.dyslexia.yale.edu/>

[R4] CDC ADHD. <https://www.cdc.gov/adhd/>

[R5] National Institute of Mental Health. <https://www.nimh.nih.gov/>

[R6] IDEA - U.S. Department of Education. <https://sites.ed.gov/idea/>
