The Problem(s)

An Achievement Gap

Approximately 13-14% of students in the U.S. (more than 6 million children) are identified as having a handicapping condition and receive special education services in school. Half of those identified for special education are classified as having a *Specific Learning Disability*, and approximately 85% of those having a primary learning disability have a learning disability in reading and language processing (i.e., *dyslexia*). As many as one third of all students may have symptoms of dyslexia, including, but not limited to, slow or inaccurate reading, weak spelling, or poor writing. Not all meet full criteria for a "disability," or will qualify for special education, but most benefit from systematic, explicit instruction in reading, writing, and language (also known as structured literacy instruction).

In my home state of Maryland, the 2015 standardized assessments revealed that those students enrolled in special education performed dismally low. On the Partnership for Assessment of Readiness for College and Careers (PARCC) assessment for grade level 10, only 7.1% of students in special education met or exceeded expected performance level (i.e., Level 4 or 5) for literacy, compared to 39.7% of all students (<u>which is still unacceptably low</u>). These results are similar to national statistics for children with disabilities. Recent data from the National Assessment for Educational Progress (NAEP) for fourth grade achievement show a significant, long-standing difference between all students and those with disabilities. From 1998 to 2013, 8.6% of students with disabilities scored proficient in reading versus 26% of non-disabled peers (<u>also unacceptably low</u>). The achievement gap for students with disabilities is especially prominent in schools with limited resources such as those in the Baltimore City Public School (BCPS) system, where the majority of the students come from low-income families and the need for services far surpasses available resources (BNIA, 2012). Moreover, according to the 2014 Department of Education Report to Congress on the Implementation of the Individuals with Disabilities Education Act (IDEA), only 10-15% of students with individualized education programs (IEPs) exit the special education system by returning to regular education.

Why Students Fail

Why is it that so many students (with otherwise adequate intelligence) struggle or fail academically in today's schools? In particular, why are so many children failing when it comes to learning to read? Is the prevalence of dyslexia so high it can explain such high rates of school failure? I assert that the answer is <u>no</u>.

There are a variety of (often inter-related) reasons, for academic failure, including: 1) poverty/disadvantage, 2) poor instruction, 3) childhood trauma (including neglect and abuse), 4) psychopathology, 5) chronic psychosocial stress, 6) illness or injury, and,the focus of my testimony, 7) highly prevalent neurodevelopmental disorders (i.e., dyslexia and Attention-deficit/Hyperactivity Disorder—ADHD). The wait-to-fail model typically associated with current educational practices, where students first have to underperform in order to receive the necessary educational interventions, suggests students with disabilities may be at risk from early on in their educational lives.

Opportunity-to-Learn

One potential explanation for this persistent achievement gap is the differential in the opportunity-to-learn (OTL), or the quantity and quality of instruction for students with

disabilities compared to their non-disabled peers. Reduced OTL exists for students with disabilities despite increased access to the general education setting and curriculum (Eckes & Swando, 2009). Moreover, there is a demonstrated OTL differential for students with disabilities and their non-disabled peers, even within the same classroom (Kurz et al., 2014).

Prevalence of Dyslexia

Dyslexia is highly prevalent. It is not just the most common learning disability, but the most common developmental disorder—twice as prevalent as ADHD, and 10-15 times as prevalent as autism. The International Dyslexia Association (IDA) reports that dyslexia affects an estimated 8.5 million school children and one in six individuals nationwide.

Societal Risks Associated with Academic Failure

Up to 76% of students with learning disabilities will be suspended at least once (Fabelo et al., 2011). The presence of a learning disability also confers a greater risk for school dropout (Cramer et al., 2014), especially among low-income students, and a well-documented connection exists between school dropout and incarceration (National Center on Secondary Education and Transition, 2012). According to the National Disability Rights Network (2012), it is estimated that as many as 50% of inmates have some type of disability. In the juvenile justice system, this number is estimated to be up to 75%. Moreover, approximately 75% of youth under age 18 who have been sentenced to adult prisons have not completed 10th grade. Within the juvenile justice population, 70% suffer from learning disabilities and 33% are reading below the 4th grade level (Coalition for Juvenile Justice, 2001). Given these observations, appropriate (and thorough) early identification and provision of evidence-based intervention for children with learning disabilities, especially dyslexia, represents a public health priority.

Problems with Current Educational Practices

While there are undoubtedly a variety of reasons behind the persistent achievement gap among children with disabilities (and dyslexia specifically), I assert that there are three critical problems with current educational practices that contribute most prominently to the chronically (and unacceptably) low performance and underlie this public health crisis.

First, pre-service teacher preparation programs fail to routinely train educators to fully understand *how learning occurs* in children (and conversely, what processes get in the way of learning) using current knowledge from the developmental, behavioral, and neuroscience literature. As a result, the strategies and techniques being implemented by teachers of children with disabilities are often not based on available *scientific evidence* (i.e., a "translation gap").

Second, despite (often intensive) intervention, students with dyslexia often continue to have significant *associated problems* (e.g., behavioral, motivational, psychiatric) that interfere with learning and with routine educational interventions. Addressing only the reading problem instead of all of the needs of the child leads to incomplete and ineffective care.

Third, individuals in local educational leadership positions (i.e., those who make decisions regarding policy, training, and curricula) often do not have the training and knowledge to appropriately advocate for *policy changes* that ultimately benefit the behavior and learning of students with dyslexia.

Issues Complicating the Care of Individuals with Dyslexia

The Trouble with Terminology

Despite best efforts by the scientific community, heterogeneity in terminology and definitions remains an impediment to achieving consensus in identification, treatment, and epidemiology. For the purposes of my testimony, I consider *dyslexia* to be equivalent to (or interchangeable with) a developmental learning disorder (or specific learning disability) in reading (i.e., reading disability or disorder). In other words, dyslexia is one type of (specific) learning disability.

The Individuals with Disabilities Education Improvement Act of 2004 uses the term *Specific Learning Disability*, defined as: "A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. The term *includes* such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia, while it *excludes* children who have learning problems that are primarily the result of visual, hearing, or motor handicaps; of mental retardation (now known as intellectual disability); of emotional disturbance; or of environmental, cultural, or economic disadvantage."

The 2013 guidelines outlined in the American Psychological Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-5) use a slightly different term: *Specific Learning Disorder*. According to the DSM-5, diagnosis is made using a synthesis of the individual's history (development, medical, family, education), psychoeducational reports of test scores and observations, and response to intervention. Thus, the DSM-5 criteria reflect a hybrid model of identification. Importantly, the guidelines also reflect recognition that individuals may "grow into" their learning deficits; thus, functional problems may not be fully manifest until a later age.

The definition of *dyslexia* used by the International Dyslexia Association—IDA (and also adopted by the Eunice Kennedy Shriver National Institute of Child Health and Human Development—NICHD), is as follows: "Dyslexia is a specific learning disability that is neurobiological 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."

The DSM-5 provides more specific guidelines in its criteria than the IDA. DSM-5 criteria for a Specific Learning Disorder in *reading* includes difficulties with learning and using academic skills, as indicated by the presence of at least one of the following symptoms that have persisted for at least 6 months, despite the provision of interventions that target those difficulties: 1) inaccurate or slow and effortful word reading (e.g., reads single words aloud incorrectly or slowly and hesitantly, frequently guesses words, has difficulty sounding out words); or, 2) difficulty understanding the meaning of what is read (e.g., may read text accurately but not understand the sequence, relationships, inferences, or deeper meanings of what is read).

Dyslexia is Defined by Low Achievement in Reading—But How Low?

Implied (or stated specifically) in the aforementioned definitions is the notion that dyslexia is a *neurobiologically* based developmental disorder that affects the brain's ability to receive, process, store, and respond to information. Although not specifically stated, dyslexia is considered to occur along a continuum, with variability in severity and characteristic features, rather than as a discrete, dichotomous entity. Put simply, in most cases, dyslexia refers to instances in which an individual's reading achievement unexpectedly falls at the low end of the normal distribution of all readers. Except in cases of very low overall intellectual level, this "low achievement" model of dyslexia is not tied to the child's overall IQ, and does not require a "significant discrepancy" between the individual's IQ and reading achievement. Conversely, the model also does not imply that individuals with dyslexia have exceptionally high IQ, or compensatory "strengths" in other cognitive or academic skill areas.

Unfortunately, while the low achievement model of dyslexia is fairly well accepted in the scientific community, there is less consensus as to the threshold for defining low reading achievement as dyslexia, with distributional "cutoff" scores ranging from as low as the 5th percentile to the 25th percentile. Not surprisingly, the scientific literature yields different findings with regard to the cognitive and behavioral phenotypes, neurobiological correlates (e.g., neuroimaging, electrophysiology), and genetics of dyslexia depending on how it is defined.

Additionally, given that the federal definition of a Specific Learning Disability in reading used in determining eligibility for special education services leaves considerable room for local interpretation (e.g., relative to the criteria for Intellectual Disability), school districts across the U.S. demonstrate considerable inconsistency in diagnostic practices. Although clearly not the intent of the federal law, *in practice*, it is not uncommon for a child receiving special education services for dyslexia in one school district to move to another district and be declared suddenly "ineligible" based on the new district's *interpretation* of the criteria.

Developmental Course of Dyslexia

Dyslexia is acknowledged as a developmental disability. That means those with "symptoms" of reading problems do not necessarily have a disability. Specifically, a disability is considered to occur when one's personal limitations (often biological in nature) produce a significant disadvantage when attempting to function in one's society. Thus, a learning disability is necessarily considered within the context of the environment, personal factors, and individualized supports. It implies that there is a "mismatch" or discrepancy between one's own biology and demands of the environment (considering all available supports). As a developmental disability, it is acknowledged that this discrepancy (and the functional impact) associated with dyslexia can change over time.

For most individuals with dyslexia, the functional deficits first have an impact in childhood, usually in the preschool or early elementary school years. For some, however, the manifestations and impact may not become evident until later in childhood, in the teenage years, or even in the adult years, even though the neurobiological basis of the condition is present earlier—a concept referred to as the "time referenced symptom" (Rudel, 1981). Nevertheless, in most individuals with dyslexia, the disorder manifests in a *persistent* functional deficit, rather than a developmental lag. The functional disability often persists over time, despite intervention efforts, and typically does not spontaneously remit with time or age. Among individuals with early-onset learning disabilities who have received consistent, high-quality intervention by early elementary school, deficits in word reading accuracy can improve; however, deficits in

phonological processing, automaticity of word recognition, expressive language, and reading fluency tend to persist.

It's Not Just Decoding: Reading Fluency and Processing Speed

Reading fluency, or the ability to read words quickly either in isolation or text, is especially critical for older children who are required to learn from what they are reading. The lack of fluency increases demands on other processes, such as working memory, and results in difficulty with comprehension because higher-level processes have to compete with word decoding for the same time-limited resources, creating a bottleneck. Therefore, especially for older children, it is critical that they are not only accurate at word reading, but also efficient, automatic, and fluent readers. It is well established that rapid automatized naming deficits (reflective of poor automaticity) are present in individuals with dyslexia; however, automaticity deficits are also observed in children referred for learning problems, whether or not they have dyslexia specifically (Waber et al., 2000).

Dyslexia and ADHD represent the two most common childhood neurodevelopmental disorders. Approximately 35-40% of children with dyslexia have ADHD; while 35-40% of children with ADHD have dyslexia. As such, the two disorders co-occur more often than expected by chance (Couto et al., 2009). The most parsimonious explanation for the co-occurrence is that they partially share genetic risk factors (Greven et al., 2011).

To this end, scientists have identified a "multiple-deficit" model to explain the comorbidity between ADHD and dyslexia in which each disorder manifests multiple deficits—some specific and some shared (Pennington et al., 2010). The ADHD model includes one unique predictor (response inhibition) and one shared predictor (*processing speed*), while the dyslexia model includes two unique predictors (phonological awareness, naming speed), and one shared predictor (processing speed). Here, processing speed represents the speed with which a task is completed with reasonable accuracy.

Children with ADHD (nearly 10% of students ages 4-17 years; Pastor et al., 2015) commonly display slow processing speed (Jacobson et al., 2011); however, slow processing speed is also observed in children with dyslexia (Willcutt et al., 2005). Becoming a skilled reader involves adequate reading fluency, which is linked to efficient processing speed. Thus, while processing speed is separable from the core phonological deficit in dyslexia, it can influence reading fluency, even among individuals who can read single words accurately (i.e., those without "classic" phonological dyslexia), and can affect the development of more complex academic skills such as reading comprehension (Sesma et al., 2009).

To this end, *processing speed* (a core skill underlying reading fluency) may represent a promising candidate for a behavioral "polyphenotype" (i.e., a phenotype constituting core deficits of more than one disorder), whose psychological makeup can account for comorbidity between common neurodevelopmental conditions and whose genetic architecture can account for the phenotypic correlations between these highly prevalent disorders (Gregorinko, 2012).

Late Emerging Reading Disabilities and Reading Comprehension

Approximately 41% of all students with dyslexia *have late-emerging reading disabilities*; that is, deficits are not evident until at least third grade. This pattern, sometimes known as the "fourth-grade slump," can be associated with the transition from "learning to read" to "reading to learn," and may also be related to reduced vocabulary development in students of low socioeconomic status backgrounds. From this point forward, curricula emphasize fluency and

comprehension rather than more basic word recognition skills. Beyond third grade, students are also expected to be able to incorporate cause/effect sequences, goals/plans for characters, and conclusions that relate to final events to those at the beginning of the story (all higher-order cognitive skills). Children who received early intervention and showed improvement may start to struggle again with the increased demands and volume of middle and high school reading and when they are expected to work more independently.

Late-emerging reading disabilities are often associated with coexisting conditions, especially ADHD, the second most common developmental disability. It is clear that children who have early problems involving basic word recognition will most likely also have difficulty with reading comprehension; however, more recently, researchers have identified groups of children without reading basic word reading deficits who go on to have difficulties in reading comprehension, perhaps as a result of their associated executive function deficits (Sesma et al., 2009). These children are considered to have "specific" reading comprehension disorders (Cutting et al., 2009; Locascio et al., 2010), and many also have associated ADHD. Working memory deficits (i.e., problems "holding" and manipulating information mentally) associated with ADHD can prevent students from monitoring what they read, as they are more susceptible to being distracted by detail when reading longer text—failing to "remember" main ideas. These findings challenge the long held "simple view" of reading (Hoover & Gough, 1990), which argued that reading comprehension was primarily the product of word reading and listening comprehension, and acknowledge the important contribution of higher-order "executive function" skills to the development of competent reading.

Early Detection of Dyslexia—Proceed with Caution

The 2016 Research Excellence and Advancements for Dyslexia Act (READ Act) (H.R. 3033) supports important research to further our understanding of dyslexia, including emphasis on better methods for *early detection* and *teacher training*. The Act specifies early identification of children and students with dyslexia, professional development about dyslexia for teachers and administrators, curricula development and evidence-based educational tools for children with dyslexia. As an educator, clinician and scientist, I applaud these efforts.

Nevertheless, when considering early detection of dyslexia (i.e., a developmental *disability*, as defined above), it is critical to distinguish between "unexpected" and "unwarranted" failures in reading achievement. In other words, when considering early detection, one must determine whether a problem represents true dyslexia or a brain that is not (yet) ready to read. To be clear, with informed assessment, risk for dyslexia can be identified early (often in the preschool years); however, we need to be very careful that we are not simply identifying children who are not yet biologically ready to read, but who have been pushed (too early) into academic demands. The scientific literature suggests that early (and accurate) identification of dyslexia and appropriate teaching of reading can prevent the experience of failure in children who are at risk. With appropriate interventions, the life history of students with dyslexia can be substantially "normalized" and secondary mental health issues averted.

In the last 20 years, however, even before NCLB, ESSA, Common Core Standards, or PARCC, there has been an alarming trend towards increasing early academic demands, such that Kindergarten is the "new first grade." These practices ignore the child (and brain) development scientific literature as it relates to developmental readiness for academic demands. There are risks associated with developmentally premature educational expectations for the children who experience failure, and the emotional/motivational consequences of encountering premature

reading and writing expectations may be long lasting. Moreover, the over-burdening of the already under-supported special education services with the "unready" now becoming indistinguishable from the truly dyslexic is yet another serious consequence. At the level of brain development, children forced prematurely to perform academic tasks may do so and appear to make progress, however, at the expense of using suboptimal circuitous pathways in the brain that ultimately may fail to support efficient and comfortable skill utilization in later years. This risk is exacerbated in young boys, whose physical maturation and brain development are at least a year behind that of same-age girls by Kindergarten entry (Eme, 1992; Lenroot et al., 2007).

Thus, the (very appropriate) mission of early detection of dyslexia presents us with a conflict that requires awareness of the developmental appropriateness of reading instruction and reading expectations for a significant proportion of students in Kindergarten (or younger).

"Pure" Dyslexia is the Exception, Not the Rule

Most definitions of dyslexia specify that the observed difficulties in reading are not due to other physical, cognitive, or emotional exclusionary factors. The assessments of these exclusionary factors are often complicated, because dyslexia commonly co-occurs with ADHD, language and other communication disorders, developmental motor coordination disorder, and other psychiatric disorders, including anxiety disorders and depression.

A sizeable proportion of students with dyslexia have associated social-emotional problems, with estimates ranging from 38% to 75% (Bryan et. al., 2004). A recent meta-analysis revealed that approximately 70% of students with learning disabilities experience higher levels of anxious symptomatology than their peers without learning disabilities (Nelson & Harwood, 2011), raising the concern that many (if not most) students with dyslexia are at high risk for anxiety disorders that cause additional distress, reduce motivation, and complicate interventions (given the negative impact of anxiety on cognitive performance of all kinds). Students with learning disabilities are also at greater risk for developing depression, as they tend to struggle with self-esteem and are less socially accepted than students without learning disabilities (Maag & Reid, 2006), and some studies have shown a link between learning disabilities and increased rates of suicide (Bender et al., 1999).

Given these associations, "pure" dyslexia is more the exception than the rule, and attention to the associated conditions and risks is of paramount importance.

What Needs to be Done

The prevalence, morbidity, and societal costs associated with dyslexia represent a major public health concern. In light of the problems cited above, I offer the following recommendations to support individuals with dyslexia and their families.

1. *Support Translational Educational Practices*. The wealth of scientific knowledge is often not accessible to front line teachers. Pre-service (undergraduate and graduate) and professional development training programs for teachers provide inadequate training in evidence-based practices for identification of dyslexia and intervention. If teachers are trained in evidence-based practices, they will use them. If they enter the field without this training, they will need access to professional development programs, along with supervision and mentoring, in order to use these programs with accuracy and fidelity.

2. *Strive for Consistency in Diagnostic Practices*. It is critical for the scientific and educational communities to work toward a common language and a common set of procedures for identifying dyslexia, with efforts aimed toward more specific terminology.

3. *Increase opportunity-to-learn (OTL) for students with dyslexia*. OTL is dependent on three interrelated classroom practices: 1) the amount of instructional time committed to the curriculum; 2) the use of evidence-based practices for teaching students with dyslexia; and, 3) classroom emphasis on best practices for supporting and developing high-order cognitive skills, such as problem solving, planning, and organizing thoughts and information (which are especially important, considering the comorbid conditions associated with dyslexia). Given the increased emphasis within classroom assignments and in standardized testing (such as PARCC) on integration of information, self-monitoring, and problem solving, competence in higher-order cognitive skills (executive functions) is critical to student success and to narrowing the achievement gap.

4. *Recognize the many forms of dyslexia*. Dyslexia should be considered to include not only difficulties in phonology, decoding, automaticity and word recognition, but also the (often later emerging) problems in reading fluency and comprehension.

5. *Support training of general educators.* Recognize that most children with dyslexia are taught primarily by general education teachers. It is critical to support inclusive practices in which special educators and reading specialists collaborate with general educators.

6. *Treat the whole child—not just reading.* Support efforts that allow acknowledge that students with dyslexia are at risk for psychosocial, language, motivational, academic, neuromotor, and psychiatric comorbidities. By treating only reading problem, we reduce the chances for positive outcomes.

7. *Support use of developmentally appropriate methods for early identification.* It is critical that those involved in early identification of dyslexia understand the potential for misidentification of children who are prematurely placed into academically accelerated programs before their brains are developmentally ready.

References Cited

Baltimore Neighborhood Indicators Alliance Jacob France Institute. (2012). *Vital Signs 10: Measuring Baltimore's continued progress towards strong neighborhoods.* Retrieved from www.bniajfi.org/vital_signs_report/Vital_Signs_10_Full_Report.pdf

Bender, W.N., Rosenkrans, C.B., & Crane, M. (1999). Stress, depression and suicide among students with learning disabilities: Assessing the risk. *Learning Disabilities Quarterly, 22,* 143-156.

Bryan, T., Burstein, K., & Ergul, C. (2004). The social-emotional side of learning disabilities: A science-based presentation of the state of the art. *Learning Disabilities Quarterly, 27,* 45-51.

Coalition for Juvenile Justice. (2001). *Abandoned in the back row, new lessons in education and delinquency prevention, coalition for juvenile justice, 2001 annual report.* Retrieved from https://www.juvjustice.org/sites/default/files/resource-files/resource_122_0.pdf

Couto, J. M., Gomex, L., Wigg, K., Ickowicz, A., Pathare, T., Malone, M., … Barr, C. L. (2009). Association of ADHD with a candidate region for reading disabilities on chromosome 6p. *Biological Psychiatry, 66*(4), 368-375. doi:10.1016/j.biopsych.2009.02.016

Cramer, E.D., Gonzalez, L., & Pellegrini-Lafont, C. (2014). From classmates to inmates: An integrated approach to break the school-to-prison pipeline. *Equity & Excellence in Education, 47,* 461-475.

Cutting, L. E., Materek, A., Cole, C. A. S., Levine, T., & Mahone, E. M. (2009). Effects of fluency, oral language, and executive function on reading comprehension performance. *Annals of Dyslexia, 59*(1), 34-54. doi:10.1007/s11881-009-0022-0

Eckes, S.E., & Swando, J. (2009). Special education subgroups under NCLB: Issues to consider. Teachers College Record, 111, 2479-2504. Eme, R. F. (1992). Selective female affliction in development of disorders of childhood: A literature review. *Journal of Clinical Child Psychology, 21,* 354–364.

Fabelo, T., Thompson, M. D., Plotkin, M., Carmichael, D., Marchbanks, M. P., III, & Booth, E. A. (2011). *Breaking school rules: A statewide study of how discipline relates to student's success and juvenile justice involvement*. Retrieved from https://csgjusticecenter.org/wp-content/uploads/2012/08/Breaking_Schools_Rules_Report_Final.pdf

Fletcher, J. M. (2009). Dyslexia: Evolution of a scientific concept. *Journal of the International Neuropsychological Society, 15,* 501-508. doi:10.1017/S1355617709090900

Greven, C. U., Harlaar, N., Dale, P., & Plomin, R. (2011). Genetic overlap between attention-deficit hyperactivity disorder and reading is largely driven by inattentiveness rather than by hyperactivity-impulsivity. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 20,* 6-14.

Grigorenko, E. L. (2012). Correspondence: Translating quantitative genetics into molecular genetics: Decoupling reading disorder and ADHD – Reflections on Greven et al. and Rosenberg et al. (2012). *Journal of Child Psychology and Psychiatry, 53*(3), 252-253. doi:10.1111/j.1469-7610.2011.02524.x

Hoover , W.A., & Gough , P. B. (1990). The simple view of reading. *Reading and Writing, 2*(2), 127-160. doi:10.1007/BF00401799

Jacobson, L., Ryan, M., Martin, R., Ewen, J., Mostofsky, S., Denckla, M., … Mahone, E. M. (2011). Working memory influences processing speed and reading fluency in ADHD. *Child Neuropsychology, 17*(3), 209-224. doi:10.1080/09297049.2010.532204

Kurz, A., Elliot, S.N., Lemons, C.J., Zigmond, N., Kloo, A., & Kettler, R.J. (2014) Assessing opportunity-to-learn for students with disabilities in general and special education classes. *Assessment for Effective Intervention, 40,* 24-29. DOI: 10.1177/1534508414522685.

Lenroot, R. K., Gogtay, N., Greenstein, D. K., Molloy Wells, E., Wallace, G. L., Clasen, L. S., … Giedd, J. N. (2007). Sexual dimorphism of brain developmental trajectories during childhood and adolescence. *NeuroImage, 36*(4), 1065-1073.

Locascio, G., Mahone, E. M., Eason, S., & Cutting, L. E. (2010). Executive function among children with reading comprehension deficits. *Journal of Learning Disabilities, 43*(5), 441-454. doi:10.1177/0022219409355476

Maag, J.W., & Reid, R. (2006). Depression among students with learning disabilities: Assessing the risk. *Journal of Learning Disabilities, 39,* 3-10.

National Center on Secondary Education and Transition. (2012). *Dropout and graduation: Frequently asked questions*. Retrieved from http://ncset.org/topics/dropout/default.asp?topic=36

National Disability Rights Network. (2012). *Issues: Criminal justice*. Retrieved from http://www.napas.org/en/issues/criminal-justice.html

Nelson, J.M., & Harwood, H. (2011). Learning disabilities and anxiety: A meta-analysis. *Journal of Learning Disabilities, 44,* 3-17.

Pastor, P., Reuben, C., Duran, C., & Hawkins, L. (2015, May). *Association between diagnosed ADHD and selected characteristics among children aged 4-17 years: United States, 2011-2013*. (Issue Brief No. 201). Hyattsville, MD: National Center for Health Statistics.

Pennington, B., McGrath, L., Rosenberg, J., Barnard, H., Smith, S., Willcutt, E., … Olson, R. K. (2010). Gene x environment interactions in reading disability and ADHD. *Developmental Psychology, 45*(1), 77-89. doi:10.1037/a0014549

Rudel, R.G. (1981). Residual effects of childhood reading disabilities. *Annals of Dyslexia, 31*(1), 89-102.

Sesma, H. W., Mahone, E. M., Levine, T., Eason, S., & Cutting, L. (2009). The contribution of executive skills to reading comprehension. *Child Neuropsychology, 15*(3), 232-246. doi:10.1080/09297040802220029

Waber, D., Wolff, P. H., Forbes, P. W., & Weiler, M. D. (2000). Rapid automatized naming in children referred for evaluation of heterogeneous learning problems: How specific are naming speed deficits to reading disability? *Child Neuropsychology, 6,* 251-261.

Willcutt, E. G., Pennington, B. F., Olson, R. K., Chhabildas, N., & Hulslander, J. (2005). Neuropsychological analyses of comorbidity between reading disability and attention deficit hyperactivity disorder: In search of the common deficit. *Developmental Neuropsychology, 27*(1), 35-78.