Testimony Before Field Hearing of the Senate Committee Health Education Labor & Pensions Committee (HELP),

Statement of

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Tuesday, October 13, 2015.

Good morning Senator Cassidy, fellow members of the Panel and attendees. Thank you for the opportunity to speak with you about the science of dyslexia and share with you the tremendous scientific progress that has been made in dyslexia. In particular, we want to focus on dyslexia as an explanation and potential solution to the national epidemic of reading/school failure.

My name is Bennett Shaywitz, M.D., I am a physician-scientist and the Charles and Helen Schwab Professor in Dyslexia and Learning Development and Co-Director of the Yale Center for Dyslexia & Creativity at the Yale University School of Medicine. Both a child neurologist and neuroscientist, I have been a leader in applying functional magnetic resonance imaging (fMRI) to understand the neurobiology of reading and dyslexia in children and adults. These studies identify a neural signature for dyslexia, making a previously hidden disability visible, and for the first time demonstrate the brain basis for the lack of fluency in dyslexia. Our most recent studies focus on differences in brain connectivity between dyslexic and typical reading children and adults and studies in progress use fMRI to investigate attentional mechanisms in reading and dyslexia.

The author of over 300 scientific papers, my honors include election to membership in the National Academy of Medicine of the National Academy of Sciences and recipient of the Distinguished Alumnus Award from Washington University. I currently serve on the Boards of the Park Century School and the Westmark School. I previously served on the Institute of Medicine Immunization Safety Review Committee, on the National Vaccine Program Safety Subcommittee and on the Scientific Advisory Board of the March of Dimes. I have been selected annually for *Best Doctors in America* and *America's Top Doctors*.

As you will hear, in dyslexia, science has moved forward at a rapid pace so that we now possess the data to reliably define dyslexia, to know it's prevalence, it's cognitive basis, it's symptoms and remarkably, where it lives in the brain and evidence-based interventions which can turn a sad, struggling child into not only a good reader, but one who sees herself as a student with self-esteem and a fulfilling future.

The Problem

Overwhelming evidence indicates that we are in the midst of a national epidemic of reading/academic failure. **Accumulating scientific evidence demonstrates that dyslexia both may be at the root of the reading difficulties noted and provide a potential solution to this unfortunate epidemic.** The difficulty is that although the evidence is there, schools do not appear to be aware of and/or using this scientific knowledge to remediate the highly prevalent epidemic of reading failure. It is imperative that schools must increase their awareness of dyslexia.

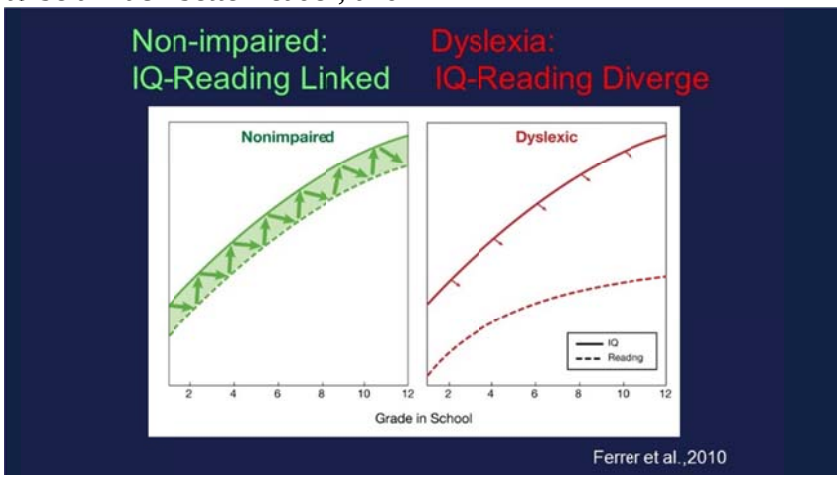
The most recent data from the National Assessment of Educational Progress (NAEP, 2013) demonstrate that African American students are especially impacted by this epidemic of reading failure. For example, fully half (50%) of African American boys and girls are reading below basic levels compared to 21% of white students. Sadly, these reading difficulties are not only highly prevalent in children of color and those who are disadvantaged, but they far too often go unrecognized and unaddressed. In these children their significant reading difficulties tend to be written off to environmental issues or lack of ability. What science has taught us is that these reading difficulties can be addressed and remediated, but only if the child is identified as dyslexic.

Unexpected nature of dyslexia

Dr. Morgan's initial description of dyslexia over 100 years ago as an *unexpected* difficulty in reading has now been validated by empiric evidence. Our research group found that in typical readers, IQ and reading are dynamically linked, they track together over time and influence each other. In contrast, in dyslexic readers, reading and intelligence are not linked and develop more independently so that a child who is dyslexic can have a very high IQ and, *unexpectedly*, read at a much lower level.

This unexpected nature of dyslexia is now recognized in the 21st century definition of dyslexia found in Cassidy-Mikulski Senate resolution 275. Here dyslexia is:

(1) "defined as an unexpected difficulty in reading for an individual who has the intelligence to be a much better reader; and



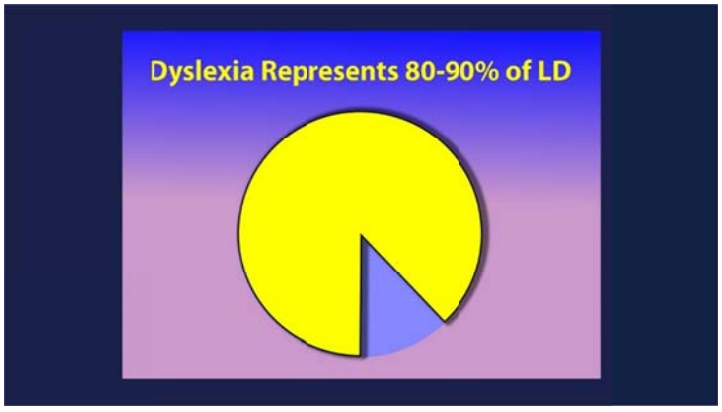
(2) Due to a difficulty in getting to the individual sounds of spoken language which affects the ability of an individual to speak, read, spell and often, learn a second language;

The Cassidy-Mikulski resolution not only recognizes the unexpected nature of dyslexia but also incorporates what 21st century science knows about the cognitive basis of dyslexia. Dyslexia is a difficulty within the language system, more specifically, the phonological component of language – it is not seeing words backwards.

Data from laboratories around the world now answer the question – why do otherwise bright and motivated children struggle or even fail to learn to read? Almost invariably, they have a phonologic deficit. To explain, converging evidence over the past several decades supports the phonological basis of dyslexia. Phonological refers to the smaller pieces of language that make up a spoken word. To understand the implications of this theory, we compare what we know about spoken compared to written language. Spoken language is natural and does not have to be taught - everyone speaks. Reading is artificial and must be taught. The key in learning to read is that the letters have to be linked to something that has inherent meaning – the sounds of spoken language. To read, the beginning reader must come to recognize that the letters and letter strings represent the sounds of spoken language. She has to develop the awareness that spoken words can be pulled apart into their basic elements, phonemes, and that the letters in a written word represent these sounds. Children and adults who are dyslexic struggle to pull apart the spoken word and, as a result, cannot isolate each sound and attach it to its letter. Results from large and well-studied populations of dyslexic children confirm that in young children as well as adolescents a deficit in phonology represents the most specific and robust correlate of dyslexia.

Dyslexia is specific; learning disabilities are general

Dyslexia is the most common and most carefully studied of the learning disabilities, affecting 80% to 90% of all individuals identified as learning disabled. Of the learning disabilities, dyslexia is also the best characterized and the oldest. In fact, the first description of dyslexia preceded the first mention of learning disability by over sixty years – dyslexia was first reported by British physician, Dr. Pringle Morgan, in 1896, describing Percy F., "He has always been a bright and intelligent boy, quick at games, and in no way inferior to others of his age. His great difficulty has been – and is now – his inability to learn to read." – a description that characterizes the boys and girls, men and women, I continue to see to this day. In contrast, the term learning disabilities was first used only in 1962.



Dyslexia differs markedly from all other learning disabilities. Dyslexia is very specific and scientifically validated: we know its prevalence, cognitive and neurobiological origins, symptoms, and effective, evidence-based interventions. Learning disabilities is a general term referring to a range of difficulties which have not yet been delineated or scientifically validated. Learning disabilities are comparable to what in medicine are referred to as 'infectious' diseases, while dyslexia is akin to being diagnosed with a strep throat – a highly specific disorder in which the causative agent and evidence-based treatment are both known and validated.

Epidemiology of dyslexia

Scientific studies in a range of disciplines provide epidemiologic, cognitive and neurobiological data to characterize dyslexia. Epidemiologic data from sample surveys in which *each* individual is assessed indicate that dyslexia is highly prevalent, affecting one in five, yes you read this correctly. It is not the stated prevalence often quoted. Why? The why is the reason we are here today – schools far too often fail to acknowledge, much less identify, students who are dyslexic. Consequently, schools will report low, but incorrect numbers of students affected. *If dyslexic children are not identified, they cannot be counted.*

Many believe that even this 1 in 5 estimate may be too low. For example, data from the 2013 National Assessment of Educational Progress (NAEP, the Nation's Report Card) indicate that 2 in 3 students in 4^{th} or 8^{th} grade are not proficient readers. Among some groups of students the numbers are far worse. The NAEP data show that 4 in 5 African-American, Latino and Native American students are not proficient readers. Many would consider this to be an out-of-control epidemic of reading failure, and considering its negative consequences, a national crisis demanding action. Longitudinal studies, prospective and retrospective, indicate dyslexia is a persistent, chronic condition; it does not represent a "developmental lag."

Sample surveys in which every subject has been individually assessed show relatively equal numbers of males and females affected. Studies based on school-based identification show a high male prevalence with accompanying data indicating that the often disruptive behaviors of the boys in the classroom play a strong role in bringing them to the attention of their teacher with subsequent referral. Girls who may be struggling readers, but who are sitting quietly in their seats, far too often fail to be identified.

Dyslexia has no known boundaries, it is universal, affecting virtually all geographic areas, and both alphabetic and logographic languages. For example, my book, *Overcoming Dyslexia*, (Knopf) has been translated, as expected, into alphabetic languages (Portuguese, Dutch, Croatian, etc.) but also, a surprise to me, logographic scripts including Japanese and Korean, and most recently, Chinese. In addition, dyslexia occurs in every ethnic, race and socio-economic class.

Neural Signature of dyslexia

Converging evidence using functional magnetic resonance imaging (fMRI) from our own and laboratories around the world has identified three major neural systems for reading in the left hemisphere, one region, anterior, in Broca's area and two regions posterior, one in the parieto-

temporal (or Wernicke's area), and another, in the occipito-temporal region, often referred to as the word form area. Furthermore, such fMRI studies indicate that in dyslexic readers, the posterior neural systems are functioning inefficiently, providing a *neural signature for dyslexia*. Critically, these posterior neural systems appear to be important in skilled, automatic reading and inefficient functioning in these neural systems suggest an explanation for the slow, effortful reading characterizing dyslexic readers. Recent studies of brain connectivity by us and others demonstrate that in dyslexic readers there is reduced connectivity to the posterior neural systems responsible for skilled, automatic reading.

In dyslexia: an action gap

So what's the problem? The good news is that our problem is a solvable one. Of course, we are always seeking new knowledge. In dyslexia there is sufficient high quality scientific knowledge to help and to turn around the lives of so many struggling children. In dyslexia, remarkably in America, in the year 2015, we have not a knowledge gap but an action gap. We have the knowledge but it is not being put into policy and practice and far too many children and adults, too, are suffering needlessly. There is an epidemic of reading failure that we have the scientific evidence to treat effectively and we are not acknowledging or implementing it. It is our hope that hearing the depth and extent of the scientific knowledge of dyslexia will alert policy makers to act and to act with a sense of urgency.

The really good news: Science is there for those who are dyslexic. We must align education with 21st century science. A major step in bringing science and education together is the Cassidy-Mikulski Senate resolution 275 which provides the most up-to-date, universal, scientifically valid definition of dyslexia incorporating scientific advances in understanding dyslexia, especially, its unexpected nature, and represents a landmark in aligning science and education.

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Good morning Senator Cassidy and fellow panel members. I too, thank you for the opportunity to speak with you about the science of dyslexia and share with you the tremendous scientific progress that has been made in dyslexia. Following Dr. Bennett Shaywitz, I, too, will focus my statement on dyslexia as an explanation and potential solution to the national epidemic of reading/school failure.

My name is Sally Shaywitz and I am a physician-scientist, The Audrey G. Ratner Professor in Learning Development, and Co-Director of the Yale Center for Dyslexia & Creativity at the Yale University School of Medicine. I am a member of the National Academy of Medicine of the National Academy of Sciences, and have served on the Advisory Council of the National Institute of Neurological Diseases and Stroke (NINDS), the National Research Council Committee on Women in Science and Engineering, co-chaired the National Research Council Committee on Gender Differences in the Careers of Science, Engineering and Mathematics Faculty and have served on the Congressionally-mandated National Reading Panel and the Committee to Prevent Reading Difficulties in Young Children of the National Research Council. I am also the recipient of an Honorary Doctor of Science degree from Williams College.

I speak to you as a physician-scientist. As a physician, I have all too many memories of sitting by an ailing child's bedside, wishing so desperately that we had the knowledge to help that child. As a physician I know the power of science and how once new knowledge becomes available we act quickly, indeed, race to put that knowledge to good use. We want to close that knowledge gap and improve the lives of the affected children. When I sat on the Advisory Council of the National Institute of Neurological Disorders and Stroke, we constantly asked ourselves: how have we benefited mankind, how has our research improved the well-being of children and adults.

Given that there has been so much scientific progress, we must take definitive steps to translate this remarkable scientific progress into practice. A fundamental question we can now address is what is dyslexia and what does dyslexia look like.

The paradox of dyslexia

Dyslexia is a paradox, the same slow reader is often a very fast and able thinker – giving rise to our conceptual Sea of Strengths model of dyslexia as a weakness in getting to the sounds of spoken words surrounded by a sea of strengths in higher level thinking processes such as reasoning and problem solving. Reflecting this paradox are many eminent dyslexics – financier Charles Schwab, attorney David Boies, cardiac surgeon Dr. Toby Cosgrove, Hollywood agent Ari Emanuel, producer Brian Grazer, and economist Diane Swonk. On the other side of the coin, are many who are not identified, do not receive evidence-based instruction, continue to struggle to read and see themselves as failures. Sadly, these boys and girls have no knowledge of what their difficulty is or that it even has a name, have no self-understanding, come to view themselves as dumb or stupid, see themselves as not meant for school, suffer low self-esteem, often drop out of school with a loss to themselves, to their families and to society.

Understanding the origin of the difficulties leads to an understanding of the symptoms of dyslexia.

With the phonologic deficit recognized and validated, it is now possible to understand and to predict the symptoms emanating from this basic difficulty, which can be both observed and measured, resulting in an accurate diagnosis of dyslexia. Dyslexia is a language based difficulty and impacts spoken language, for example, word retrieval difficulties; reading, initially impacting reading accuracy and then reading fluency, the ability to read not only accurately, but also rapidly and automatically with good understanding. Not being able to read automatically, dyslexic readers must read what I refer to as 'manually,' requiring the output of large amounts of effort and consuming much of the individual's attention. A dyslexic reader lacks fluency meaning that he reads slowly and with great effort, although he may understand the content at a high level. Importantly, the dyslexic's vocabulary and comprehension may be quite high. Spelling is also problematic as is learning a foreign language – all reflected in the Cassidy-Mikulski Senate Resolution 275.

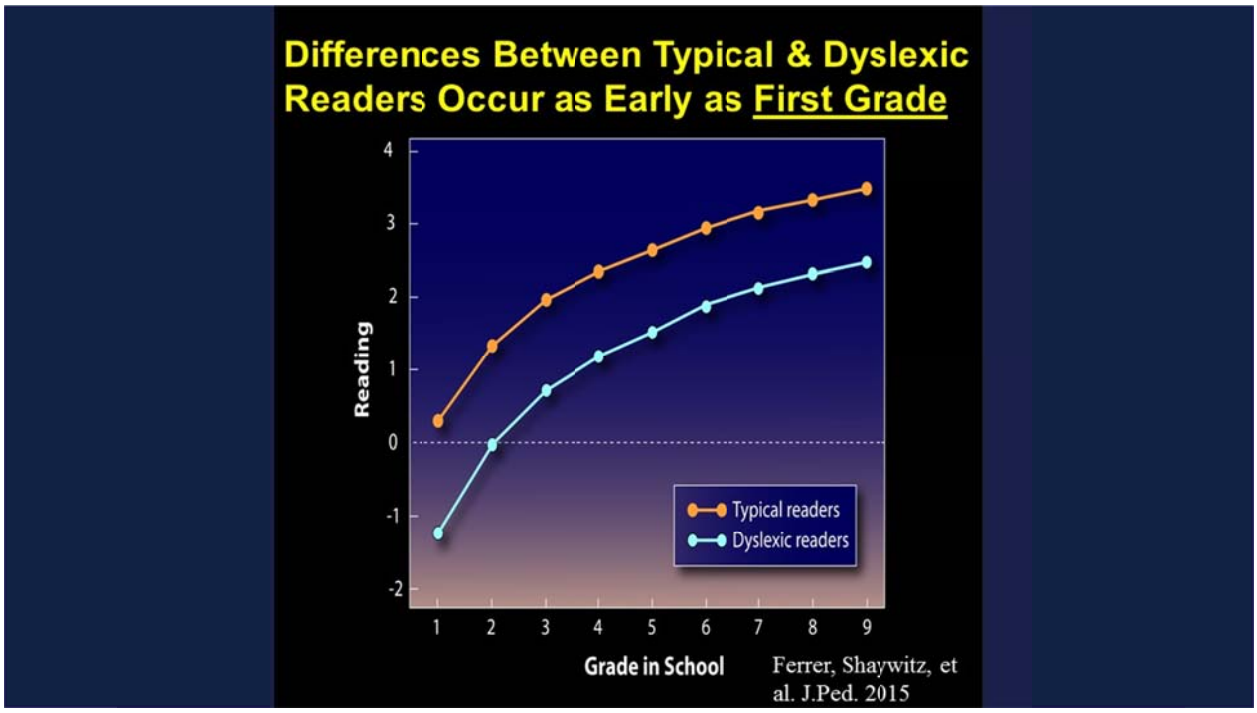
Barriers to utilizing scientific knowledge to enhance the education of dyslexic students.

Unfortunately, scientific knowledge is not being utilized by far too many schools. The major barriers include: schools that are unwilling to diagnose or accept a diagnosis of dyslexia and schools that don't 'believe' in dyslexia. As a consequence, students are hurt by the failure of these schools to provide evidence based interventions and accommodations. In addition, the lack of understanding of dyslexia leads to a failure to address the needs of the whole child. As noted, dyslexia affects: spoken language, reading accuracy and reading fluency and the ability to read math problems, to spell and to learn a second or foreign language. These struggles particularly when not addressed lead to anxiety and at times depression and loss of self-esteem, often with negative life-long effects.

Reading gap already present by first grade and persists

Scientific knowledge, too, has delineated the progression of reading development. Reading growth is most rapid early on, during the first few years of school and then plateaus. In a report to be published in November, 2015, we report the results of a longitudinal study of reading from

first grade to 12th grade and beyond. We find that as early as first grade, compared with typical readers, dyslexic readers had lower reading scores and their trajectories over time never converge with those of typical readers. These data demonstrate that such differences are not so much a function of increasing disparities over time but instead because of differences already present in first grade between typical and dyslexic readers. We conclude that the achievement gap between typical and dyslexic readers is evident as early as first grade, and this gap persists into adolescence. These findings provide strong evidence and impetus for early identification of, and intervention for young children at risk for dyslexia. Implementing effective reading programs as early as kindergarten or even preschool offers the potential to close the achievement gap.



National Reading Panel and teaching reading

Fortunately, thanks to Congressional action there is now strong evidence of what treatment elements are effective in teaching children to read. In 1998 Congress mandated the formation of a National Reading Panel to investigate the teaching of reading. I was proud to serve on the panel which produced the Report of the National Reading Panel. As a result, today it is no longer acceptable to use reading programs lacking scientific evidence of efficacy; instead it should be mandatory to use programs that are evidence-based, proven to be effective in the same way that medications must be tested and proven to be effective before they can be approved by the FDA. Our children deserve no less. And yet, today, this powerful information is not being used in schools, children are not learning to read and giving up, and not reaching their full potential. We have what amounts to an educational emergency in the US. Children are not learning to read with serious academic, economic and health consequences including, school drop-out, being half as likely to go on to college, significantly lower lifetime earnings, significantly higher

unemployment, higher rates of mental health issues such as often incapacitating anxiety, and, as reported in 2013, significantly higher mortality rates related to lack of a high school diploma. These harsh consequences harm not only the dyslexic individual but place our country at a competitive disadvantage.

Effective reading intervention for dyslexia

There is much known scientifically and clinically about dyslexia and its impact on children. Synthesizing that information brings with it the strong suggestion that a dyslexic child is best served, first by early diagnosis which should lead to early intervention, especially that there are now data indicating, as noted above, that the achievement gap is already present and large at first grade. The size of this gap makes it exceedingly difficult to overcome with time. It provides a strong impetus to identify and address dyslexia very early in the student's school career. Assessment for phonological skills early on and/or having the child's teacher complete a relatively short questionnaire, such as the Dyslexia Screening Measure (DSM) which is based on longitudinal data, can provide data with good sensitivity and specificity indicating a child's risk of being dyslexic.

Currently, dyslexic children are either not identified, and even if, identified provided with pull out instruction of about 45 minutes several times a week. The child feels isolated and embarrassed. S/he is often teased and/or bullied, and returns to a class where s/he has missed the instruction other students have received. Most of his/her teachers have no idea of what dyslexia is, and believe it is reversing letters. This means that teachers in the child's other classes such as social studies, science or biology, math or literature are totally unprepared to understand or educate the dyslexic child. These educators have no or little idea of the student's reading level and how to best address the child's reading, writing, spelling and word retrieval difficulties. Points are taken off for mis-spellings in history, a student's difficulty in reading the words in a math problem are mistakenly ascribed to lack of understanding of math principles and so it goes. It is critical that the dyslexic child is in a school where the entire faculty is on board and understands dyslexia and how best to address the needs of a child who is dyslexic.

Dyslexic students require frequent opportunities to interact with their instructor; this is only possible in small groups as noted by the Report of the National Reading Panel. In large groups, dyslexic students have little opportunity to interact with the instructor, perhaps once during a period, if that. This is totally insufficient and does not provide the opportunity for the instruction to take hold. Methods must be based on evidence and not anecdote or belief systems, e.g., "I know in my heart that this methods works. I believe in it." Teachers must be knowledgeable about dyslexia and flexible. Dyslexic students are not fluent readers, this means that they may know how to read one moment and then, a short while later, not be able to decipher the very same word. It is imperative that teachers understand the impact of lack of fluency on reading, and similarly, are aware that if a dyslexic student is called on to read aloud, it is often unbearably embarrassing or if she is asked a question, her word retrieval difficulties arising from her dyslexia may result in her not being able to retrieve the correct word – due not to a problem in higher level cognitive functioning or lack of knowledge but due to her inability to access and retrieve the sounds of the words that are needed for her to articulate the word correctly. Students are in a school during the day going to many classes; it is critical that the child's teachers are

united and function as a knowing and caring team that is fully aware of where the child is in his/her reading, how s/he is being instructed and the effective approaches to supporting this student in each teacher's subject class and is aware of, and following, the student's progress carefully. This requires teachers to function as a team, that is, to be in constant contact with one another and there to be on-going consistency in instruction.

The most effective models that work for dyslexic students are specialized schools specifically for these students. There are a number of such specialized schools for dyslexic students nationally. Students attending such schools benefit, learn to read and succeed in their academic work and come to appreciate, too, that they are not stupid. However, what these independent schools have in common is high tuitions that many middle class parents, and certainly not disadvantaged families, can afford. What is wonderful to see is a new model that has been developed, one exemplified by the Louisiana Key Academy (LKA) started by Dr. Laura Cassidy, which is a free public charter school that brings into the school and each and every classroom all the scientific knowledge now known about dyslexia, along with a deep understanding and concern for each student at the school. I have personally visited the school, spoken with teachers, students and parents and was elated to see how well the students are learning, how they now viewed themselves as learners rather than as school failures, and, perhaps, most importantly, how much pride and self-esteem they have developed. It is very powerful to be at a school where you are part of a community of dyslexic students who are bright and where you are no longer viewed as different, inferior and not part of the group. Given the terrible epidemic of reading and school failure, and the high prevalence of dyslexia of one in five, we must ensure that LKA is sustainable and strongly supported. This school has made an extraordinary difference for so many dyslexic students who were previously ignored, feared going to school and were on the path to academic, and sadly, life failure. The difference this school has made in these students' lives is breath-taking and life-affirming. This opportunity for a chance at success must be made available to every boy and girl who is dyslexic, especially those who are disadvantaged or African-American. We, as a society, must do no less; having successful learners will not only benefit the student, but his family and community, and, indeed, the nation. **The model of LKA, a free public charter school is a model that works, a school that provides the needed 'all hands on board' climate and instruction to dyslexic students. Critically LKA addresses the needs of the whole child the entire day rather than the artificial belief that giving a child a package of instruction for a period a day will address the significant and on-going needs of a dyslexic child.**

Accommodations

Given that a student who is dyslexic has both a weakness and strengths, it is critical that for example, tests, both in school and on high stakes standardized examinations and Common Core assessments actually measure the student's ability and not his disability. The dyslexic student may learn to read fairly accurately but hardly ever with fluency; he remains a slow reader albeit a quick thinker. These dyslexic students may know the answer to a test question, but as a result of their slow reading never get to reach many questions or to finish the test, the student simply runs out of time. Or, she is so anxious about finishing the exam that she races through it and misses questions which, given the needed time, she would be able to answer correctly. Thus, it is critical that students who are dyslexic receive the accommodation of extra time; it is not a perk but a

necessity if the result of the test is to reflect that student's knowledge. In adolescents and young adults applying for high-stakes standardized tests for college, graduate or professional schools, the Americans with Disability Amendment Act (ADAA) of 2008 is highly supportive of the need for accommodations for those with disabilities like dyslexia that impair a major life activity like reading. The ADAA regulations also state that students should receive accommodations even if they are doing well in school, it is not the outcome of their performance but rather what they have to do to achieve the outcome.

High school and college students with a history of childhood dyslexia often present a paradoxical picture; they may be similar to their unimpaired peers on measures of comprehension, but they continue to suffer from the phonologic deficit that makes reading less automatic, more effortful, and slow. Neurobiological data provide strong evidence for the necessity of extra time for readers with dyslexia. Functional MRI data demonstrate that in dyslexic readers the word-form area, the region supporting rapid reading, functions inefficiently. Readers compensate by developing anterior systems bilaterally and the right homolog of the left word-form area. Such compensation allows for more accurate reading, but it does not support fluent or rapid reading. For these readers with dyslexia, the provision of extra time is an essential accommodation, particularly on high stakes tests such as SAT, ACT and tests for professional schools such as LSAT, MCAT and GRE – and for the Common Core tests. The accommodation of extra time allows the student time to decode each word and to apply his unimpaired higher-order cognitive and linguistic skills to the surrounding context to get at the meaning of words that he cannot entirely or rapidly decode. While readers who are dyslexic improve greatly with additional time, providing additional time to non-dyslexic readers results in very minimal or no improvement in scores.

A special word about the Common Core state standards (CCSS) and tests such as PARCC, which are designed to assess whether students are meeting the CCSS. **It can be stated unequivocally, that the CCSS and accompanying tests such as PARCC are totally inappropriate for students with dyslexia. Such tests are based on the mistaken belief that all students, including dyslexic students, will be fluent readers by the end of second grade and that all students should read at grade level and above, clearly an expectation that flies in the face of all that has been learned about the development of reading in dyslexic children.** Furthermore, CCSS and PARCC are based on the belief that comprehension focused reading instruction using "complex text" should be the basis of reading instruction, ignoring whether or not the student can actually read the words in the "complex text." This has had serious implications for dyslexic students. For example, the PARCC test for third grade students is more targeted to the reading level of students in fifth grade and focused on reading comprehension. This has had the pernicious effect of schools dropping all other instruction, including the much needed decoding instruction, to focus almost exclusively on comprehension. In addition, it is well known that multiple choice questions in the PARCC are inappropriate for students who are dyslexic. Common Core's overwhelming focus on comprehension may be appropriate for students in high school but is wholly inappropriate for children in very early grades, especially dyslexic students who are invariably still struggling with and working hard to master decoding.

Although providing extra time for reading is by far the most common accommodation for people with dyslexia, other helpful accommodations include allowing the use of computers for writing

essay answers on tests, access to recorded books and text to voice software. Other helpful accommodations include providing access to syllabi and lecture notes, tutors to "talk through" and review the content of reading material, alternatives to multiple-choice tests (e.g., reports or projects), waivers of high stakes oral exams, a separate, quiet room for taking tests, and a partial waiver of the foreign language requirement. Dyslexic students who have difficulty accessing the sound system of their primary language will, almost invariably, have difficulties learning a foreign language. Students with dyslexia most often have no difficulty with the mastery of high level courses. The problem lies in their lack of fluent, rapid reading so that it is the time necessary for them to read through the materials that is problematic. Many rigorous schools allow these students to take one course less during the school year and take this course during the summer. With such accommodations, many students with dyslexia are successfully completing studies in a range of disciplines, including science, law, medicine and education. It is accommodations such as these that are encouraging, and allowing, more students who are dyslexic to enter and to succeed in STEM fields.

Summary and Implications of the science of dyslexia

Yes, dyslexic children can learn to read and must be taught to read. It is imperative that teachers and parents learn about the powerful science of dyslexia, know how to identify dyslexia early on and to provide a positive climate where the entire school faculty is on-board in understanding and teaching students who are dyslexic. This can only take place in specialized schools where dyslexic students are understood, taught by evidence-based methods and are part of a community that they are welcomed into, rather than being isolated. We must not give up on teaching dyslexic children and limit a child's future options. Education must, and can be, aligned with science. To be best serve the dyslexic child, we must serve the whole child throughout the school day and not limit his education to a 45-minute pull-out once a day.

We must ensure that scientific knowledge is translated into policy and practice and that ignorance and injustice do not prevail. We know better, we must act better.

I cannot look into the face of one more child who has lost faith in himself and the world, I cannot look into the face of a child's father who is desperately trying to hold back tears; I cannot hear once again about how a school told a mother, 'we do not believe in dyslexia.'

As an iceberg is 90% underwater with only 10% visible; similarly, in dyslexia, we hear about the 10% who have made it. Let's not give up on the invisible 90% still underwater, asking, indeed, begging to be helped.

I am optimistic, once Congress, educators and parents are aware of the strong science of dyslexia, educators will want to align their practices and policies with 21st century science. Congress, in particular, can do much to address the needs of dyslexic students, to transform struggling students who do not see themselves as learners into empowered learners who see themselves as having a positive future. First and foremost, it is critical that all recognize that dyslexia cuts across all boundaries – ethnic, racial, SES, gender, national and political. All, including Republicans and Democrats must come together on this human issue; dyslexia is not, and should not, be used as a political issue. Recognizing and addressing dyslexia, the explanation and potential solution to our terrible epidemic of reading and academic failure is in the interest of

the one in five who are dyslexic, their families and our nation. I congratulate Senators Cassidy and Mikulski who have come together to sponsor the bipartisan Senate Resolution 275 that provides a 21st century definition of dyslexia and states, unequivocally, that dyslexia has significant educational implications. Isn't it time that the IDEA written first in 1974 joins the 21st century science and gives dyslexia the primacy it deserves, rather than being lost in the verbiage as an afterthought. Let's rise above political interests, acknowledge dyslexia and 21st century knowledge of dyslexia, including its prevalence, definition, identification, provision of not only evidence-based instruction but, critically, strong support for specialized schools for dyslexic students, schools whose climate of having everyone on-board and instructional methods allow dyslexic students to have their strengths, rather than their weaknesses characterize their future lives.

Schools must not be allowed to ignore or fail to recognize dyslexia. We must act now. This requires creating and supporting specialized schools for dyslexic students using the state-of-the-art LKA model. We must always keep in mind: **OUR CHILDREN CAN'T WAIT.**

For far too long, the word and the condition it represents, dyslexia, has been overlooked, not said and not used, much to the detriment of the millions of children who are dyslexic. Dyslexia is specific, highly relevant and carries with it explanatory meaning. Science provides its definition; epidemiology; cognitive basis; neurobiological basis; developmental progression; long-term outcome.

Perhaps, most important of all, the greatest beneficiary of knowing who she or he is, is the dyslexic student him/herself. To know what you have has a name and explains so much of what you experience on a daily basis and lets you know that you are intelligent, even if you can't read quickly is incredibly empowering. I have had the experience of telling so many children (and adults, too) that they are dyslexic and what that means. The absolute relief this provides can be life-changing, and indeed, life-saving. Knowledge that you are dyslexic provides the student with self-understanding and self-awareness of what s/he has and what s/he needs to do in order to succeed. Furthermore, such knowledge provides students with a community to join – for many, it is the very first time they know they are not alone. For his or her parent, teacher and importantly, the student, knowledge that s/he is dyslexic brings with it the information that the individual is not stupid or lazy.

Top priority recommendation:

Given that dyslexia affects the whole child in every class throughout the school day it seems reasonable to strongly encourage the creation of specialized charter schools that focus solely on dyslexia. Recognizing the rapid growth in reading in the very first years of school and the already present gap by first grade the school should begin as early as possible, by kindergarten or first grade. The goal is to reach children at-risk for dyslexia early on when reading intervention can be maximally effective and before the students fall further and further behind. At such specialized charter schools, such as the Louisiana Key Academy, the entire educational team from principal to classroom teacher to physical education instructor understand dyslexia, its impact on students in various situations and are on board to support the students throughout their day. Here, students learn and there is no bullying by students or frustration expressed by teachers who may not understand the impact of dyslexia. These schools can also

serve as resources where teachers can come, spend time and learn about dyslexia, what it is and how it impacts a student and learn specific evidence-based methods for teaching reading to dyslexic students and how to best implement these methods.

Other Recommendations:

- Schools must not be allowed to ignore, fail to recognize or deny the reality or diagnosis of dyslexia.
- Schools, including teachers, principals and other administrators and parents should make every effort to use the word dyslexia since it has specific, highly relevant and explanatory meaning; science has provided its: definition; epidemiology; cognitive basis; neurobiological basis; developmental progression; long-term outcome. For dyslexia, knowledge of its cognitive basis indicates what symptoms to look for so that symptoms of dyslexia in the classroom (and at home) are noted and acknowledged rather than as currently happens, ignored or overlooked. This greater awareness and understanding of dyslexia and its impact will benefit both the teacher and student, both in the teaching of reading and in the climate and attitudes within the classroom.
- Using the word dyslexia provides a common language facilitating communication among teachers, clinicians, scientists and parents.
- For the student, the knowledge that he is dyslexic is empowering, providing the student with self-understanding and self-awareness of what he has and what he needs to do in order to succeed.
- For students, knowledge that they are dyslexic also provides a community to join – they know they are not alone.
- For the parent and teacher and importantly, the student, knowledge that he or she is dyslexic brings with it the information that the individual is not stupid or lazy.
- Critically important is that schools must use <u>evidence-based</u> programs that have proven efficacy; research-based simply indicates that there are theoretical suggestions but does not provide evidence that the program is, indeed, effective. Evidence-based programs are akin to the level of evidence the FDA requires before a medication can be approved for use. Many, many theoretical, research based approaches, when tested in the field, prove to be ineffective. Our children's reading is too important to be left to theoretical, but unproven, practices and methods. We must replace anecdotal and common, but, non-evidence-based practices, with those that are proven, that is, they are evidence-based.
- Professional development programs targeted for teachers must provide <u>evidence</u> that the <u>students</u> of the teachers using these programs actually improve in their reading performance. This is in contrast to some professional development programs which seem to improve teacher's understanding but not in a way that results in improvement in their student's reading performance.
- Schools of education must ensure that aspiring teachers are taught evidence-based methods to teach reading and have monitored experience demonstrating that they are effective in implementing these methods.
- Scientific evidence that reading growth is maximum in the very first few years of school and then plateaus together with new data indicating that the reading gap between typical and dyslexic readers is already present at first grade and persists means that students must

receive evidence-based instruction at the start of their school experience and their progress carefully monitored. Waiting is harmful and not acceptable.

There is so much more to tell; for those who have questions and want to know more, visit the Yale Center for Dyslexia &Creativity website: dyslexia.yale.edu or look at my book, “Overcoming Dyslexia,” which discusses the scientific basis of dyslexia and how to translate this knowledge into practice.