



**Understanding and Serving Students with Dyslexia Advisory Group**  
**Bellingham School District Administration Office – Board Room**  
**November 8, 2018**  
**9:30 – 11:00am**

Co-Chairs:

Kristi Dominguez, Executive Director of Teaching and Learning  
Dawn Christiana, Director of Teaching and Learning

Members present:

Meri Kate Adams, Nancy Bischoff, Sara Buetow, Samantha Dang, Jennifer Gruenert, Alli Hancock, Jodi Kinzel, Stephanie Korn, LaVera Langeman, Stacey Nordtvedt, Campbell Phillips, Pam Pottle

Excused: Megan Hall

Minutes:

Welcome. Trina Hall is in attendance on behalf of her daughter Megan. Dawn stated that there are a few of this committee's members who sit on other advisory committees, including at the state level. We are pleased to have them on our committee so that we can link the work. We are looking at the state's system, and we are looking at how Bellingham fits in the context of their work.

- Develop norms as a group
  - Group activity: write three things you need as a learner.
- 1. Respectful
- 2. Kindness and compassion and understanding
- 3. Time to think
- 4. Trust
- 5. Presume positive intentions
- 6. Child centered focus
- 7. Clear expectations and outcomes

We will start and end with these norms. Dawn reminded the committee that they are in an 'advisory' role. We can't make any decisions, but we can give recommendations to the district administration. In between the meetings we are going to trust that when we go into the community, we are going to be respectful of the committee's work and what they share.

Question was raised as to where the recommendations are sent. Dawn responded that it will go to the Superintendent, Executive Team and DTL Directors. Dawn and Kristi reminded the group that there are many other initiatives happening concurrently as this committee. This committee is just one of many others. A committee member asked about what other committees that are going on currently: <http://bellingshamschools.org/about/committees-advisory-groups/>

*The committee viewed this video prior to the meeting with these questions in mind:*

<https://youtu.be/zafiGBrFkRM?t=12>

Committee participated in an activity of discussing the video. Their comments were:

What is the strength in this message?

- Variables in the variety of levels of dyslexia
- Time to it takes to process
- Like the simulations
- Like that it said you could change your brain
- Neurodiversity
- It also showed people who are successful

What would you add?

- What are the strengths of the individuals?
- Processing piece was not as clear
- It touched on it but could go deeper
- Dyslexia is not a cognitive deficiency
- Learn from OSPI Dyslexia Advisory members

Jodi presented the following OPSPi Advisory Council update:

## **OSPI Advisory Council Update #1**

### **1. What is the new **Dyslexia Law E2SSB 6162** about?**

Quick Summary:

\*(1) Beginning in the 2021-22 school year, and as provided in this section, each school district must use multitiered systems of support to provide interventions to students in kindergarten through second grade who display indications of, or areas of weakness associated with, dyslexia. In order to provide school districts with the opportunity to intervene before a student's performance falls significantly below grade level, school districts must screen students in kindergarten through second grade for indications of, or areas associated with, dyslexia as provided in this section.

### **2. Who are the Council Members?**

### **3. What is the end outcome of the council? Another quick summary:**

Develop recommendations regarding:

\*Screening implementation

\*Multi-Tiered Systems of Support (MTSS)

\*Educational information for Families

\*Addressing needs of students above grade two expectations

| Statute Expectations   | Timeframe |
|--|-----------|
| Advise on Dyslexia   | ongoing   |
| Identify Screening Tools   | June 2019 |
| Develop Recommendations  | June 2020 |
| Review Assessment Inventory Data Collection for Best Practice Implementation | ongoing   |
| Review Implementation  | June 2022 |

4. Where is the Council currently in the process?

- We have had two full day meetings
- Agendas of our meetings are attached
- We left our last meeting focusing on phonological awareness, phonemic awareness, letter sound knowledge, and rapid naming skills. We were also creating a common definition of a screener, talking about why we screen and that districts don't have to choose one of the screeners we suggest but that screeners must be based on best practices that we suggest by June 2019.
- We meet again on November 19<sup>th</sup> and will continue to develop the Request For Information criteria for publishers.

Celebratory/challenging: Teacher raises, budget cuts

- Align our understandings of Dyslexia
- Analyze the current state of Bellingham School District

We believe in Bellingham Public Schools, that the parent is the child's first and most important teacher.

The committee discussed the complexities of the range of providers in our community: Public Education, Literacy teachers, primary care doctor, special education.

Public educations have worked mostly in a one-way direction with information sharing. It is up to the family to request the exchange of information.

Medical Providers:

A committee member commented that they are 100% willing to partner with specialists and would attend IEP meetings. We need to be strong as the central evidence based best practice.

Tutors:

Large variability in providers.

A committee member commented schools cannot provide all of the tools for all kids. That's why families seek outside resources.

Suggestions to encourage a positive message early on.

[Power Point Presentation](#)

Jennifer Gruenert: Shared information from her brain research. Identified challenges. Orthographic, working memory.

### Dyslexia neuroscience – structures and functional correlates

Brief review by Jennifer Gruenert, MS, CCC-SLP, speech/language pathologist

- The Shaywitz definition we discussed in the previous meeting is referenced in current research and literature, with its emphasis on phonological awareness and phonological processing challenges in the absence of other challenges with oral language (i.e., listening comprehension, oral expressive language), cognition\*, motivation, sensory deficits, and/or lack of reading instruction (Lyon, Shaywitz, & Shaywitz, 2003).
- That said, current research also clearly references other related skills or subskills that are consistently present for individuals with dyslexia, and Functional MRI (fMRI) and structural MRI scans support the presence of differences in specific areas of the brain that correlate to most of these skills. These include:
  - Orthographic knowledge (orthographic awareness, phonics knowledge/skills, knowledge of English spelling rules, including alphabet knowledge) and morphological knowledge/awareness;
  - Mental imagery for words (i.e., Mental Graphemic Representation, Mental Orthographic Imaging, or remembering what words “look like”);
  - Working memory;
  - Executive functions, including inhibition, coordination of effort between different processing skills (rapid attention switching), attention to the written code, and sustained processing over time;
  - Lexical access to long-term storage (i.e., Rapid Naming Skills, linguistic retrieval, word finding).
- **A few definitions:**
  - “Orthography” → the spelling system of a language; how we represent spoken words with letters for writing and reading; English has about 205 spellings for its 44 sounds (or phones); 84 of the 90 most common English spelling rules have exceptions.
  - “Phonology” → the sound system of a language; how we represent meaning with spoken sounds.
  - “Morphology” → the meaning system of a language; how we use meaning chunks to build bigger meanings; the meeting point between phonology and semantics (word meaning); e.g., *hand*, *-s*, but also the *wr-* in *wrist*, *write*, *wring*, *wrong*
  - “Phone” → actual sound produced by the speech mechanism (what we say); e.g., [b, ae, i, o]

- “Phoneme” → mental correlate of a phone (what we hear/recognize); e.g., /b, ae, i, o/
  - “Grapheme” → written letter associated with a phoneme; e.g., *b, a*
  - “Digraph” → two letters associated with a phoneme; e.g., *th, ee*
  - “Multigraph” → more than two letters associated with a phoneme; e.g., *ough*
- **Phonological awareness and processing** – the ability to recognize and manipulate sounds that make up words (in the absence of letters) in order to map these sound units onto printed words for reading and spelling. Housed in the temporo-parietal cortex, which governs cross-modal integration. Increased engagement of this region is associated with the development of phonological skills and learning to read.
    - Least important for common/high-frequency words that with practice become recognized by the VWFA (see below) as “sight words”.
    - Remains highly activated for words that require rule-based decoding (or sounding out).
    - Pseudowords tax systems in mapping print to sound and use the same processes readers use when decoding words that are new to them.
    - Active processing of phonological information for spoken language, speech processing, *and for silent reading* is housed in the left inferior frontal cortex, along with verbal memory, semantic processing, and other language skills. As children develop their reading skills, activation shifts away from this region to other regions of the brain as phonological processing matures and children rely less on articulatory behaviors.
    - White matter tracts – the left arcuate fasciculus connects temporo-parietal regions to frontal lobe regions and supports phonological processing.
  - **Orthographic knowledge** (orthographic awareness, phonics knowledge/skills, knowledge of English spelling rules, including alphabet knowledge) – refers to knowledge/understanding of the alphabetic principal, in which written symbols correspond to speech sounds, as well as “higher level” spelling rules that do not follow one-to-one / phoneme: grapheme (sound: letter) correspondences.
    - Early ability (or lack thereof) to learn letter names and associated sounds is highly correlated with later development or fluent reading and spelling.
    - English has an “opaque” spelling system, rather than a transparent one. Even our alphabet does not have a 1:1 correspondence between its letters and their associated sounds.
    - Research conducted by the UW LDC found that Dyslexia is associated with processing impairments in orthographic skills and rapid automatic naming, in addition to phonological skills.
    - For many “higher level”/phonetically opaque spelling rules, including (1) sight words/red flag words/oddball words and those that govern (2) multi-syllabic words and (3) homophones, morpheme knowledge and morphological awareness come strongly into play; e.g., (1) *friend, blood, & breakfast*; (2) *wanted/walked/solved* and *solvent/solve/solution/dissolve/dissolution*; and (3) *their/ there/they’re*.

- **Mental imagery for words** (Mental Graphemic Representation, or **MGR**) appears to be housed in the left occipito-temporal cortex, which supports automatic visual processing of word forms and strings of print/text. Activation appears to be specific to word forms vs. faces, objects, or other visual cues. This area is known as the “visual word form area” (VWFA).
  - This pattern is consistent across language and spelling systems (orthographies) whether the spelling system is opaque (e.g., English) or transparent (e.g., Italian, Spanish).
  - In pseudoword reading/spelling tasks, activation in this region becomes stronger as the pseudoword sequences become more word-like.
  - This area – the VWFA – does not develop specialization for letters or written words without the educational experience of learning to read; true for children and for adults who have later-in-life reading instruction (i.e., low literacy adults).
  - Evidence suggests that VWFA *sensitivity* – responding to prints vs. faces or objects – develops very early in the process of learning to read, but the VWFA *sensitivity* – responding to actual letters and letter groups vs. letter-like symbols – emerges more slowly and results from years of reading experiences.
  - White matter tracts – the inferior longitudinal fasciculus connects the temporal and occipital lobes, including the VWFA – important in connecting visual word information to word meanings, but not phonological awareness.
  
- **Working memory** – the ability to hold information in mind while performing other tasks (or “work”) without losing/distorting it. Housed in the left inferior frontal cortex, along with other aspects of language and reading, including phonological and semantic processing, silent reading, and speech planning.
  - “Dyslexia is a language disorder and a working memory disorder” (Berninger, Abbot, Thomson, et al. 2006; Swanson, 2006).
  - Phonological working memory is an aspect of verbal working memory, as are orthographic and morphological working memory.
  - Ability to recall and repeat nonsense words is correlated with phonological awareness and processing issues, as is recall and repetition of sets of unrelated numbers or words (e.g., CTOPP subtests).
  - The impaired word-level reading and spelling skills in dyslexia are associated with impaired processing in working memory components, which interferes with fluency (i.e., temporal coordination).
  
- **Executive functions** – housed in the pre-frontal cortex (PFC), these are self-regulatory, inhibitory, planning, flexibility, time awareness, and problem solving skills that develop slowly over the course of childhood and into early adulthood.
  - Coordination and connections between different regions of the brain, including primary auditory and visual regions, are essential to fluent reading and spelling in applied tasks.
  - Many models frame working memory as an EF skill. There is WIDE variability.
  - Executive function impairment is common across dyslexia and dysgraphia.

- Research conducted by the UW LDC found executive functions for inhibitory control and switching attention to be impaired in individuals with dyslexia, and to persist after phonological/orthographic issues had yielded to effective remediation, often impacting reading fluency and written language production.
- **Lexical access to long-term storage** (i.e., RAS/RAN, Rapid Naming Skills, linguistic retrieval, word finding). – refers to the ability to “pull up” information from long-term, language-based storage with sufficient speed and accuracy to support effective information processing.
  - In typical readers, larger volumes of gray matter throughout the “reading network” (e.g., temporo-parietal and occipito-temporal regions) are correlated with better (faster, more accurate) rapid naming performance, as well as better reading ability and better phonological skills.
  - The automaticity that characterizes proficient reading can be measured in pre-readers via rapid naming tasks. About 75% of individuals who struggle with reading also have rapid naming deficits.
  - Research conducted by the UW LDC found that Dyslexia is associated with processing impairments in rapid automatic naming and orthographic skills, in addition to phonological skills.
  - Accurate storage and retrieval of word forms – phonological, orthographic, and/or morphological aspects – is impaired in dyslexia, dysgraphia, and oral language disorders that can limit reading.

\*There is emerging research that struggling readers show the same patterns of brain difference and functional challenges, independent of their performance on IQ measures (Tanaka et al., 2011).

#### Sources

Berninger, V.W., & Wolf, B.J (2009). *Teaching Students with Dyslexia and Dysgraphia: Lessons from Teaching and Science*. Paul H. Brooks Publishing Co., 127-140.

- Beginning in 1995, the University of Washington Multidisciplinary Learning Disabilities Center (UW LDC) conducted research in the areas of reading and writing challenges, including dyslexia and dysgraphia and related family genetics research.

D’Mello, A.M., & Gabrielli, J. D.E. (2018). Cognitive Neuroscience of Dyslexia. *Language, Speech, and Hearing Services in Schools* 49 (4), 798-809. <https://lshss.pubs.asha.org/article.aspx?articleid=2711411>