PUZZLING OUT

DYSLEXIA

Early Intervention is Key

By SHERRY SQUIRES

When a child is first learning to read, there are some natural stumbles. Sounding out words takes time and can be frustrating. But knowing whether a child is experiencing the typical struggles of a new reader or something more — a learning disability — has long been a challenge.

Diagnosing a reading disorder such as dyslexia traditionally has relied on a reading test. But results are often difficult to interpret. Maybe the student just needs a little individualized attention, or a bit more practice. Maybe it's best to wait and see how they do.

"Unfortunately, that is in direct conflict with what we know about early intervention," said Dr. Evelyn Johnson, a professor of special education at Boise State. "If we can get them help right away we have a much better chance of keeping their reading proficiency at grade level. When we delay intervention the child's reading achievement gap increases, and it becomes harder to overcome."

New research by Johnson may help make diagnosing dyslexia much less of a guessing game.

ALLISON CORONA PHOTO

Boise State master's student Meagan Payne gets practical experience working with young students at the Lee Pesky Learning Center in Boise.

"It's interesting because the virtual maze is a non-language-based task, and one of the longstanding issues with dyslexia identification and intervention is that you tend not to notice the signs until the child starts learning to read. If a non-language test is able to predict their reading performance, it could serve as a potential early indicator," Johnson said.

The researchers have connected with Yale Genetics Lab to analyze saliva samples from 5- and 6-year-old children in their latest study, looking for links between the DCDC2 gene, difficulty reading and trouble with the maze. Gabel and Johnson also have applied for a grant to expand their study, and Johnson is working with Dr. Brett Shelton in Boise State's Department of Educational Technology on a grant to create a web-based maze that would be inexpensive and easy to share with parents and schools.

"We have only studied a small number of kids, so just like any research, we have to be cautious about how we frame the results," Johnson said. "But early results from the study are showing that these connections hold."

ALLISON CORONA PHOTO

Post-doctoral researcher Brady Webb, left, and Dr. Evelyn Johnson utilize a virtual maze to study its potential effectiveness as a diagnostic tool for dyslexia.

SPECIAL EDUCATION

For Johnson, school was a refuge.

Johnson was a good student and got a lot of support from teachers, which helped offset some negatives in her life at the time. "School should be a place of validation and support and caring for every child, regardless of who they are and what they come to school with," she said. "Special education is a place where that matters the most, and that's why I entered the field."

Idaho has held pretty constant with about 10 percent of its student population needing special education services. The national average is about 12 percent, with a lot of variability across states. Special education teachers are in high demand in every state and U.S. territory.

As schools moved to inclusion models, it changed the way we prepare special education teachers for their jobs. Becoming a certified special education teacher in the '70s or '80s meant a teacher specialized in a particular field, such as reading, or working with visually or hearing impaired students. But today's special education teachers are more generalized in their training because they will work with students with a variety of disabilities.

"Instead of going deep, we go broad," Johnson said. "That makes sense, but the downside is special education teachers don't have the opportunity to develop really strong deep expertise in any one area."

A hearing impairment or visual impairment can be easy to detect, but learning disabilities are more subtle. If a teacher isn't

particularly well versed in understanding possible indicators, a child's struggle is sometimes thought to be a lack of motivation or laziness, Johnson said. That leads to frustration and sometimes avoidance, or negative behaviors from children whose learning needs are misunderstood. For all involved — child, parent and teacher — it's a difficult process.

THE MAZE

Before joining Boise State in 2007, Johnson spent four years as a research associate for the National Research Center on Learning Disabilities. Three years ago, she teamed up with neurobiologist Dr. Lisa Gabel at Lafayette College in Easton, Pennsylvania. Gabel had been studying behaviors in mice related to the DCDC2 gene. The gene has been linked to visual processing and possibly to a greater susceptibility to dyslexia.

Gabel found that mice with a mutated DCDC2 gene did not perform as well as their counterparts on the classic Hebb-Williams maze, often used to test memory in animals. Gabel and Johnson set out to see if the maze might also predict reading disabilities in children.

They started with a small study of Idaho children ages 8-13, administering reading assessments and then having the children complete a virtual version of the maze. While their sample size was small, they did find strong correlations between children who struggled with their reading performance and also had difficulty navigating the maze.

LEE PESKY LEARNING CENTER

In addition to her role as professor, Johnson also serves as executive director of the Lee Pesky Learning Center in Boise, a special education collaborative with the university. The nonprofit organization aims to improve the lives of people with learning disabilities. Founder Alan Pesky sits on the board for the National Center for Learning Disabilities, the largest and most influential organization in the country in the area of learning disabilities. When he started the Lee Pesky Learning Center in 1997 there were two employees; today there are 32.

The center and Boise State's College of Education enjoy a unique collaboration that allows master's students the opportunity to get hands-on experience at the center, and chips away at a shortage of highly skilled teachers who are experts at early intervention.

"There is no other graduate program in the country that really does what we are doing," Pesky said. "We're putting the two important pieces that make up their graduate education together, the formal coursework and the opportunity to learn in an applied setting. They come out and work with children one-on-one. We can't cure a learning disability because a lot of it is about the way the brain is wired, but we can give children the skills and the opportunity to fulfill their full potential."

The partnership was featured in a National Public Radio story last January. Meagan Payne heard it and arrived at Boise State a few months later. Originally trained in criminal justice,

she discovered a passion for special education and was thrilled to learn that she could earn her master's degree at Boise State while working at the Lee Pesky Learning Center.

"All of the teachers come to the center with their own background experience, and I knew this would be an incredible opportunity to learn from the best," she said. "I have worked with students with special needs in the past, but my work was almost entirely focused on dealing with challenging behaviors. This experience at the center has taught me the systematic, explicit ways of teaching that are most successful among children with special learning needs."

The collaborative work between Boise State and the Lee Pesky Learning Center also means that new research findings quickly make their way to the students who stand to benefit.

Dr. Brady Webb met Johnson while pursuing her Doctorate of Education in Curriculum and Instruction at Boise State. She now works at Lee Pesky Learning Center as a Boise State post-doctoral fellow in evaluation and intervention for learning disabilities. She collects data for the genetic component of the research and runs reading and virtual maze assessments in Idaho schools.

"My job is fascinating because I get to bridge theory to practice in such real time," she said. "I'm already seeing the impact we're having and hoping it gets to a point where we've got enough evidence to use these tools to identify learning differences early and to design instruction that meets students' needs." *B*