Spring 2019

Dysgraphia

Madeline Brown
Southeastern University - Lakeland, msbrown2@seu.edu

Madeline Brown

Professor Veach

CC ENG 1233

22 MAR 2019

Dysgraphia

Introduction

Envision a kindergarten student sitting in school with an assignment to copy. As she sits down, she already knows the challenge writing presents for her but does not speak up or say anything because this time probably will not be any different than when she requested help before. She has been labeled as a lazy writer and has never had the most readable handwriting. All of the other children around her finish the assignment and she inevitably she remains unable to complete the first sentence. This scene does not have to play out this way. Students in schools across the world are created uniquely with different strengths and weaknesses. Teacher to student ratio, few learning disability training resources, and confusion regarding whether a child has a legitimate learning challenge all contribute to the inability of schools to accurately detect early learning disabilities (Judd 97). Without proper training, some difficult to identify diagnoses of childhood learning and behavioral struggles include but are not limited to; Dyslexia, Autism, Dyspraxia, Attention Deficit Disorder, Dyscalculia, and Dysgraphia. While each of these disorders has an approach for accommodation or correction, the preceding challenges of recognition within the classroom pose the most formidable obstacle to progress toward a solution for the student with the learning disability.

> Students who have typical or even superior intelligence may fail at school, which requires successful completion of written work to pass content subjects; not be promoted to the next grade level; not graduate from high school; and not pass high-stakes tests given in the state. Students who cannot communicate in written language are also at risk of dropping out of school altogether. All of these unfortunate outcomes may also result in emotional problems such as anxiety, work avoidance, and depression (Berninger 260).

This paper will narrow down the broad range of Learning Disabilities to focus on the recognition, diagnosis, and treatment of dysgraphia. While many of the other childhood learning disabilities follow similar patterns for recognition and diagnosis, dysgraphia poses a unique challenge in that it persists as an externally identifiable issue such as laziness in classroom work ethic or merely poor writing skill and not for what it indeed is, a fully diagnosable and treatable learning disability.

Background

Definition

Dysgraphia comes from Greek origin. *Graph,* the base word, traces back to the involvement of the hand in writing and the formation of letters. *Dys,* the prefix, demonstrates an impairment. *Ia,* the suffix, defines a condition (*Understanding Dysgraphia*). Dysgraphia, while a learning difficulty concerning handwriting and subsequent letter formation, does not directly reflect the student's level of aptness or capacity for intelligence (Hendrickx 107). Dysgraphia, primarily assumed to be a disorder involving difficulties with motor coordination, can also present itself as problems with letter order and flow, such as in the context of letter formation and pattern (Hendrickx 107).

Stages of Writing

There are seven stages of writing as identified in *Learning and Learning Difficulties* by Peter Westwood. These stages depict a child free from learning disabilities. The first stage describes writing as drawing where children draw and document information relevant to them in their current age. The second, similar but with more structure offers an act of writing as scribbling with more of imitation than merely drawing. Children notice the written world around them and compose scribbles on their paper with no actual awareness of the meaning of letters or words. As a child learns and grows, the progress into the third stage where their imitation draws closer to real writing in depictions of writing with more similarity to properly formed letters. They might understand the left to right direction of writing by watching others; however, this development can also come at the next stage of composition as reproduced common letter strings. The fourth element proves crucial in that children learn to write letter forms correctly without tracing. "When children trace or copy letters...they can often be observed drawing them. Children frequently chat while copywriting and thus their brains cannot be engaged in making grapheme-phoneme linkage" (Montgomery 98). At this stage, a child learns to freehand letters. Stage five shifts the student towards writing with invented spelling and relies heavily on creativity. Most children at this point sound out words creating awareness of pneumonic sounds and thus increasing a child's "sensitivity to sounds in words." The sixth phase progresses past basic writing and children can "adopt a more strategic and thoughtful approach," known as increased strategy use in writing. With minimal guidance, tasks that seemed difficult before, are now attained with ease, and they feel rewarded for their perseverance with the ability to write.

The seventh and final stage presents independence in writing. At this point, children demonstrate the ability to conquer the world of education and can flexibly write with proper grammar, spelling, and "self-correcting strategies" (Westwood 101-102).

On the other hand, a child with dysgraphia could get stranded in any of the above stages because their brain does not process writing like a typical student's brain would. Writing processes require metacognition, defined as an awareness of one's thought processes which drives the basic motor skill competence that involves handwriting and word operations. (Westwood 102). Dysgraphia is a handwriting impairment that has many solutions to each type.

Types of Dysgraphia

Educators can observe three types of dysgraphia; the first type of dysgraphia termed as Dyslexia Dysgraphia is where a student does not exhibit pure Dyslexic tendencies. In observations of students with this condition, they do not exhibit Dyslexia in a typical fashion. Instead, indications of this condition are from work that students write. A student with Dyslexia Dysgraphia does not necessarily have dyslexia. Written work from dyslexic dysgraphic pupils from thoughts at hand and not copied from a visually referenced source often appears virtually unreadable. Work that students copy may be more readable, but spelling mistakes will be prevalent throughout. Similar indicators present in Dyslexia Dysgraphia that align with Dyslexia, a Special Learning Disability or a SLD include illegible writing, significant spelling difficulties and struggle to copy written words. The primary differentiation comes in that the Dyslexic Dysgraphic student is typically an appropriate grade-level reader and does not struggle in that regard (Dyslexia, Dysgraphia, Dyscalculia).

Motor Dysgraphia represents the second type of dysgraphia. Contributing factors to this type are under-developed fine-motor skills and muscle tone. Written work both from copy and impromptu or direct from thought to paper will be unreadable. However, letters that students write on an individual basis are a bit more readable if concentrated upon intently by the student. In this case, spelling skills are often not on grade level (Dyslexia, Dysgraphia, Dyscalculia).

Spatial Dysgraphia remains as the third and final type of dysgraphia. This type presents as a disregard and nonexistent spatial awareness. Students with this version of dysgraphia do not stay in the lines or margins presented on the paper, and can often appear as variance in letters, letter sizes, and words on the lines. (Dyslexia, Dysgraphia, Dyscalculia).

Symptoms

Dysgraphia can occur in a wide range of scenarios and areas, presenting itself alone or paired with other learning disorders such as dyslexia. More often than not, teachers and parents do not recognize it as an obstacle to learning (Chung 27). The commonly recognized characteristics of dysgraphic children primarily present as labored and inaccurate letter formation in handwriting, spelling frustrations separate from difficulty in reading or a combination of both challenged handwriting and spelling (*Understanding Dysgraphia*). This hindrance in handwriting can affect the process of learning spelling and the speed with which a child writes. The specific challenge of dysgraphia most often manifests itself at an early age, yet it might not be noticed until later in the educational cycle when writing becomes more prevalent in the daily classroom environment (Chung 28).

Writing difficulties can cause unfavorable outcomes in the self-esteem of these struggling pupils. The student will find no satisfaction in trying to write and will avoid any hand to pencil

interaction. By not practicing these seemingly simple tasks children will, in turn, fall out of practice which results in no improvement and the cycle of failure with resultant losses in confidence and self-esteem will perpetuate. (Westwood 104).

Statistics

A recent study estimated that 7-15% of school-age children exhibit a particular writing struggle (Döhla) which directly tie to dysgraphic indications or a related learning disability that requires addressing. Applying this statistic to 2017 UNESCO Institute for Statistics estimations of primary student populations worldwide, it is compelling to note that potentially as many as 10 million children are affected with the writing impairment of dysgraphia. Even though these statistics bear out that many students struggle with writing, not very much is being done in terms of research and development for possible solutions to this deficit (McCloskey 65).

School Assistance

Even though federal law explicitly says that writing is an area in which students might exhibit tendencies toward a learning disability, the struggles for children with such disabilities to get assistance remain (Judd 96). Although Specific Learning Disabilities (SLD) are authorized special accommodation under Section 504 of the Rehabilitation Act of 1973 (PL 93-112), the arrangements provided may not address the specifics of the students SLD. A more tailored approach would link to the issues identified within the profile of the student based on their learning style and observable abilities and learning characteristics (Berninger 25).

The Free Appropriate Public Education Act does not necessarily assure families that their children are receiving the necessary help for their diagnoses (Berninger 261).

Argument

Scientific Evidence

Dysgraphia exists, and scientific evidence provides concrete foundations for dysgraphia as a fully identifiable condition. In a news article by Deborah Bach, research findings included brain matter which appeared differently on a scan of dysgraphic and dyslexic children versus non-dysgraphic and non-dyslexic children. Many teachers discount specific symptoms claiming that children are lazy or merely inattentive to directions given, but this study testifies that these children's brains require more effort than children without learning disabilities such as dysgraphia and dyslexia (Bach).

Results from a 2015 study from the Department of Radiology at the University of Washington, Seattle demonstrated that children with dysgraphia show significant differences in brain scans when applied to four different activities during an fMRI. The patients in the trial ranged from 4th to 9th graders from local schools. The study targeted those who needed additional help in early grades of school and outside of school, but continued to struggle with reading or writing (Richards 409). "Four brain region seed points (left occipital-temporal gyrus, supra-marginal gyrus, precuneus, and inferior frontal gyrus) were used in these analyses which were shown in a meta-analysis to be related to written word production on four indicators of white matter integrity and fMRI functional connectivity for four tasks" (Richards 408). These exercises included allowing the child time to meander in their thoughts, having the child write letters displayed in front of them, filling in missing letters to correctly spell fully-formed words, and brainstorm a writing project after reading the topic provided (Richards 408).

The findings of the study indicated that dysgraphia and dyslexia are not equivalent learning disabilities and therefore require different, specialized treatments. As shown on the fMRI, "the white matter connections and patterns and the number of gray matter functional connections were not the same in the children with dyslexia and dysgraphia — on either the writing or cognitive thinking tasks" (Bach). From this research, observed evidence explains the struggles that individual students may experience. Given the research above, teachers may be more equipped to divert specialized resources to children diagnosed with SLDs, instead of applying a one-size-fits-all (Bach).

The research applied and done by neuroscientists has contributed to informing schools and teachers on the importance of individualized treatment of SLDs that might not otherwise be recognized (Richard 420). Researchers have made significant advancements in a "well-specified theory of normal adult writing mechanisms," but this study and others like it still require additional research on the whole aspects of developmental dysgraphia (McCloskey 75). The information surrounding how students learn to write lacks the depth of research necessary, and therefore the resulting understanding of the causes of dysgraphia are limited (McCloskey 75). Further research needs to take place "not only for advancing our knowledge of the underlying deficits in children and adults with developmental dysgraphia but also for improving diagnosis and treatment" (McCloskey 65).

Diagnosis

"According to the DSM-4 (APA, 2000), to be officially diagnosed as having a 'disorder of written expression' a student must exhibit writing skills that fall substantially below those expected for age, educational opportunity and intelligence" (Westwood 106-107). Unfortunately,

few reliable tests to identify the standard of writing in the classroom exist. Identification often occurs with a professional observing the student's writing and basing their level of disability on that (Westwood 107).

The apparent symptoms of dysgraphia described in detail below point to a learning disability and not just assumed laziness. Symptoms can include poor spatial planning, inconsistency in letter and word spacing, unusual body position while writing, awkward pencil grip, difficulty articulating thoughts onto paper, and a significant difference between spoken comprehension and written comprehension (Hendricks 110). In the diagnosis of dysgraphia, a specialist can assess the writing ability of the student.

A psychologist should evaluate children through an assessment by taking a history of the student's development to determine when the condition began and how long they have been struggling with writing (Hendrickx 109). Psychologists can ask teachers questions about their students' capabilities. These could include questions about verbal versus nonverbal thought processing, weakness in comparison to grade-level peers, and the legibility and speed of their writing (Berninger 258-259). This diagnostic of questions should encourage the teachers to be involved with the professionals in gathering information for a proper diagnosis and understanding what steps need to be taken to treat the student effectively (Berninger 259).

Assistance

The process of assisting dysgraphic children remains relatively straightforward. Specific Learning Disabilities can be treated with proper teaching and activities to connect further the two hemispheres of the brain that reveal a disconnect because of the glitch that some children have in their brains (Berninger 23). Specific handwriting training can be used to allow the student to

practice handwriting without difficulties. Working on fine motor skills with children can also help dysgraphia. The building of these skills can include any activity that crosses the midline of the body and uses the other hemisphere of the brain. Additionally, offering alternatives such as dictation or shorter writing exercises can boost student's self-esteem as well as further their education (Devine 40).

Writing Eight

The solution to completely fixing dysgraphia requires time and patience. The writing eight method developed by Dr. Gettmen "is designed to transfer the entire writing, fine-motor and visual/spatial processing responsibilities to the child's right brain, which is the storage place for all automatic processes. This exercise, performed at home, crosses the brain/body midline and opens up the child's writing gate, which increases writing fluency and eliminates reversals. This 15-minute exercise rehabilitates the Visual/Spatial system" (Karie). This system could take up to a year to see results of correction. Improvements could come as early as three months, but monitoring and consistency are essential (Karie).

Handwritten Notes

Alternatively typing notes could improve upon taking notes by hand. However, "students learn better when they take notes by hand" rather than taking notes on a keyboard. By taking handwritten notes, many children have seen improvements by having to restructure the lesson they have just heard and process it in a different capacity than if they took notes on a keyboard (Montgomery 97). In another experiment, the act of typing or even tracing a letter did not produce any brain activity on an fMRI scan (Montgomery 97).

Cursive

Moreover, teaching cursive remains as another alternative to printed handwriting with dysgraphic students. Cursive proves useful because it flows from left to right wholly eliminating the possibility of letter reversal. Students also may find themselves able to write faster without the writing becoming unreadable (Montgomery 99). Cursive "reinforces multi-sensory learning linking spelling, reading and speaking; pupils with mild handwriting coordination difficulties experience less pain and difficulty; and it improves the legibility of those with coordination difficulties unless they have severe problems when alternative support is needed" (Montgomery 99). Although teachers do not consistently teach cursive in schools, it can be useful with the learning disability of dysgraphia.

Refutation

Lazy Writing

Often, teachers imply that children who exhibit struggles with writing do not apply themselves enough and might own the label of careless. This lack of motivation stems from the inability to process these letters. Children do not purposely get out of work because they think it is too hard. They legitimately struggle to spell words due to a blockage in written communication. This blockage, of sorts, leads to problems with creativity, capability, and overall cognition (Berninger 260). Teachers must self-educate of the difference in learning styles that children might have. An informed and encouraging teacher will strive to make sure that children understand what they can do versus dwelling on the negative of what they cannot do (Devine 40). Consider the following case study: Creative Thinker.

> I recall when teacher training teaching a class of six- and seven-year-olds in a mainstream school. One wonderful little boy really struggled with handwriting. The poor handwriting meant that he was always grouped with the children who were struggling to keep up. His handwriting was holding him back in all subjects. That same little boy came alive when we had carpet time with his hand shooting up with ideas for different adjectives. While the rest of the group would use the word 'big', he had a bank of amazing words – 'gigantic', 'enormous', 'expanded'. What if the class were asked to write these words down? His list would not have been so extensive. I made sure he had lots of opportunities to show this ability and incorporated this creative vocabulary-building time into all of our literacy lessons. It improved the other children's opinions of this child and got them trying to think more creatively, which would also improve their writing skills. I could almost see this boy plump his young feathers as his self esteem improved" (Devine 41).

If a child presents as a struggling writer but has bright and intelligent ideas, it remains ill-advised for a teacher to hold them back due to their lack of penned expression (Devine 40). Teachers should encourage and support the creativity the child possesses and desires to express such as writing a poem instead of a long story (Devine 40).

Messy Writing

One could pose the question if most young children write with sloppy handwriting, how does it remain an indicator of dysgraphia? Research findings show that if a child older than seven-years-old has handwriting that a typical adult would struggle to read, dysgraphic tendencies may be present (*Dysgraphia: More Than Just Bad Handwriting*). This research with

an fMRI scanner proves that handwriting is more crucial to...development...than many researchers have thought before (Montgomery 97). Furthermore, dysgraphia can present itself when children first learn the proper way to write. The child often writes in an unnatural way or positions themselves awkwardly, and physical pain can also be a symptom depending upon the type of dysgraphia the child has (*Dysgraphia: More Than Just Bad Handwriting*). Handwriting is something to notice when observing a young child, especially the letter formation and sizing because these all remains as indicators of dysgraphia.

Normal Growth

Another question posed states that, even if dysgraphia stands as an actual learning disability, parents assume their children can outgrow it, so why would educators spend time on treatment? According to a recent static 48% of parents think their child could outgrow their particular learning disability (*When Messy Handwriting Becomes Dysgraphia: A Writing Disorder*). As encouraging as parent's faith in their children's abilities may seem, numerous students go on to struggle with their specific learning disability for the rest of their life. Unfortunately, even with many resources for children with SLD's, some parents have a fundamental confusion of where to start in the advocation for their children. With research and dedicated time to gather information about their child's learning style, parents can come alongside their students and help them in a way few educators ever could. The outcome of this engagement could dramatically improve a child's education and their coping mechanisms with their challenges for the rest of their life (*When Messy Handwriting Becomes Dysgraphia: A Writing Disorder*).

Conclusion

The learning disability of dysgraphia does indeed exist as proved by research including much done by the University of Washington in Seattle. Even with this research, the diagnosis tends to lack support from educators and public school systems even though treatments exist. Clearly, there are many approaches, for home and school, to suit each struggling writer's learning style. Dysgraphia is more prevalent than ever in school all across the world and with a couple of small, easy tweaks, students could be writing with less frustration. For educators, by providing frequent opportunities for children to write, giving clear and concise feedback to the student on mistakes, and using other methods involving all the senses (eyes, ears, and hands), students might feel better equipped to write in the future. The approaches parents and students can take involve, look-say-cover-write-check, a phonemic approach, spelling by analogy, and repeated writing (Westwood 114).

These brilliant children need advocates in the field of Learning Disabilities. Although often put on the back burner in an educational setting, dysgraphia can have detrimental effects on the future learning of a child (Chung 33). Picture the student from the beginning of this paper. It is a year later and the now first-grade student who has been receiving treatment for her diagnosed dysgraphia. Her self-esteem has improved immensely, and although not wholly 'cured,' she has found tools that help her cope with how her brain works. This fictional story serves as an illustrative example of how struggling writers can excel when educators, parents, and psychologists acknowledge dysgraphia and advocate for these students.

Works Cited

Bach, Deborah. “Research Shows Brain Differences in Children with Dyslexia and Dysgraphia.” April 28, 2015, sec. Education, News Releases, Research. https://www.washington.edu/news/2015/04/28/research-shows-brain-differences-in-children-with-dyslexia-and-dysgraphia/.

Berninger, Virginia Wise, and Beverly J. Wolf. *Dyslexia, Dysgraphia, OWL LD, and Dyscalculia : Lessons from Science and Teaching*. Second edition. Baltimore, Maryland: Paul H. Brookes Publishing Co., 2016.

Chung P., and Patel D.R. “Dysgraphia.” *International Journal of Child and Adolescent Health* 8, no. 1 (2015): 27–36.

Devine, Adele. *Literacy for Visual Learners : Teaching Children with Learning Differences to Read, Write, Communicate and Create*. London: Jessica Kingsley Publishers, 2016.

Döhla, Diana et al. “Cognitive Profiles of Developmental Dysgraphia.” Frontiers in psychology vol. 9 2006. 22 Nov. 2018, doi:10.3389/fpsyg.2018.02006

“Dysgraphia: More Than Just Bad Handwriting.” *Reading Rockets*, 23 Aug. 2017, www.readingrockets.org/article/dysgraphia-more-just-bad-handwriting.

“Dyslexia, Dysgraphia, Dyscalculia.” Indiana Department of Education, Sept. 2017, www.doe.in.gov/sites/default/files/specialed/dyslexia-dysgraphia-dyscalculia.pdf.

Hendrickx, Sarah. *The Adolescent and Adult Neuro-Diversity Handbook : Asperger Syndrome, ADHD, Dyslexia, Dyspraxia and Related Conditions.* London: Jessica Kingsley Publishers, 2009.

Judd, Sandra J. *Learning Disabilities Sourcebook*. 4th ed. Health Reference Series. Detroit: Omnigraphics, 2012.

Karie. "Daily Lesson Plan for the Struggling Writer and Speller." Child Diagnostics. Accessed March 22, 2019. https://diannecraft.org/language-arts-writing-program/.

McCloskey M, and Rapp B. "Developmental Dysgraphia: An Overview and Framework for Research." *Cognitive Neuropsychology* 34, no. 3–4 (2017): 65–82. https://doi.org/10.1080/02643294.2017.1369016.

Montgomery, Diane. *Dyslexia-Friendly Strategies for Reading, Spelling and Handwriting : A Toolkit for Teachers*. London, United Kingdom: Routledge, 2017.

Richards, T. L., T. J. Grabowski, P. Boord, K. Yagle, M. Askren, Z. Mestre, P. Robinson, et al. *"Contrasting Brain Patterns of Writing-Related DTI Parameters, FMRI Connectivity, and DTI–FMRI Connectivity Correlations in Children with and without Dysgraphia or Dyslexia."* NeuroImage: Clinical 8 (January 1, 2015): 408–21. https://doi.org/10.1016/j.nicl.2015.03.018.

"Understanding Dysgraphia – International Dyslexia Association." Accessed March 20, 2019. https://dyslexiaida.org/understanding-dysgraphia/.

Unesco Institute for Statistics. *"UIS Statistics."* UIS Statistics, data.uis.unesco.org/. Accessed April 6, 2019.

Westwood, Peter S. *Learning and Learning Difficulties : Approaches to Teaching and Assessment.* Taylor & Francis, 2013.

"When Messy Handwriting Becomes Dysgraphia: A Writing Disorder." Therapeutic Movements, 10 Dec. 2018, therapeuticmovements.com/messy-handwriting-dysgraphia-writing-disorder/.