FEATURE

MUSIC READING FOR STUDENTS WITH LEARNING DISABILITIES

By Elizabeth Morrow

As a career cello pedagogue and as a certified dyslexia instructor, I have been sought out by many string teachers for insights into how to help their students who struggle with music reading. Over time, I observed that this was a hidden problem without a research-based solution. To investigate further, I invited a self-selected cohort of string teachers to fill out a survey concerning music reading difficulties in their classrooms or studios. Fifty-two out of fifty-three respondents agreed that they had students in their programs who did not or could not learn to read music within the context of standard instruction. If you are like the many teachers with whom I have raised the question, you may have experienced this as well.

In academic classrooms, students who are found unable to read or write words will be tested and provided with appropriate resources and instruction for literacy. In our music classrooms, there is no such response. Because there is no academic music reading mandate, there is little research about students who struggle with note reading and no unified approach to remediation. The reality is that, if students are struggling to read music, they most likely are not being provided appropriate resources and instruction and may ultimately quit their music programs.

What Can Be Learned about Remediation from Dyslexia Research

In 1935, Anna Gillingham, a gifted educator and psychologist, and her collaborator, Bessie Stillman, published the Gillingham–Stillman manual, *Remedial Training for Children with Specific Disability in Reading, Spelling and Penmanship*. This seminal work, based on research done with neuropsychiatrist Samuel Orton, introduced a new way of teaching reading that proved to be highly effective with children who suffer from dyslexia and other language-related learning disabilities. It became known as the Orton-Gillingham approach and uses a style of instruction called Multisensory Structured Language (MSL). Orton-Gillingham-based approaches are now the standard for dyslexia remediation. As will be shown below, this style of instruction, shown to establish the neural networks necessary for reading, can be highly adaptable to the task of teaching children to read music.

MSL has very strict parameters that are essential for successfully building these networks:

1. *Simultaneous, Multisensory*: MSL uses visual/auditory and kinesthetic-tactile pathways simultaneously to enhance memory and learning.
2. *Systematic and Cumulative*: MSL instruction must follow a strict order of learning that moves from the simplest to the most complex. Each new skill needs to build upon the previously taught skill.
3. *Direct and Explicit*: Teachers must teach to the individual student's needs, making no assumptions about skills and knowledge students will acquire on their own.
4. *Diagnostic and Responsive*: Continuous assessment remains responsive to student's needs.
5. *Synthetic and Analytic Instruction*: Synthetic instruction presents the parts and teaches how the parts work together to form a whole. Analytic instruction presents the whole and teaches how this can be broken down into component parts (Birsh 2005).

How do these principles relate to our current ways of teaching students to read music? Actually, they do not. In most classroom and studio approaches, music reading is taught secondarily to learning to play a musical instrument or to sing. The logical structure of teaching how to make music supersedes the logical structure of teaching how to read music. Examples of this include:

- Method books that begin reading with open strings. From a playing perspective, this makes perfect sense, but, from a reading perspective, there is no logical connection between *g* and *d*, or *d* and *a*. The note names have no logical connection and must simply be memorized.
- Classroom methods begin in the key of D Major to facilitate accommodating heterogeneous classrooms. Students learn to read sharps without any rational understanding of what a sharp is and why there would be sharps in D Major. The most common response when I ask reading-challenged violinists what a sharp is "it's when you play your second finger higher," indicating no understanding of the meaning of sharp. This approach to instruction does not build a strong reading foundation which can be built upon.
- Beginning method books that begin with quarter notes. This makes perfect sense from a playing point of view, but, from a reading standpoint, it is analogous to learning the alphabet beginning with *m* and having to expand learning in two different directions. This is not logical, systematic, or cumulative learning.

Unfortunately, when music reading is relegated to the second tier of the learning process, it is forced to follow the logical instructional order of making music instead of reading music. This might seem like a small thing, but it has huge consequences for learning disabled (LD) brains which need logical, structured learning styles. This may include students with dyslexia and/or

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dyscalculia (math learning difficulty), short-term or working memory issues, or focus issues related to ADHD.

Although not as widely identified as dyslexia, dyscalculia (pronounced dis cal cyul' e uh) can greatly impact a student's ability to learn to read music. A study from the University of Miami found that regarding dyscalculia, "musical challenges and coping strategies . . . pertained to reading and memorizing music, counting during resting periods, subdivision, music theory, and motor skills" (Hosseini 2020).

Components of a Multisensory Structured Music Reading Program

Our goal in teaching students with disabilities is not to impart skills through rote memorization, but to create knowledge through understanding by following a strict order of learning that moves from the simplest to the most complex. And so, we begin with the staff itself: What is it? And why does it function the way it does? Here is an example of an introduction to the staff:

- Provide the student with a blank piece of paper and direct them to draw a circle or a "bubble" in response to individual pitches played on a keyboard. Demonstrate a very high pitch while suggesting that high pitches be placed toward the top of the page and demonstrate a very low pitch while suggesting that low pitches be placed toward the bottom of the page. Then give examples between high and low, and suggest they be placed more in the middle of the page. Play a series of random pitches and allow the students to draw bubbles in response (Figure 1a). There is no "right or wrong," it does not really matter where the bubbles go.
- Place a full-page lined transparency over the bubble page (Figure 1b). In most instances, the student will have an "aha" moment as the configuration of lines and circles look familiar, and the bubbles on the lines and spaces represent something concrete. Discuss with the student how interfacing the bubbles and lines might give the relative pitches they heard a place to "live" and be found again.
- Replace full-page lines with an eleven-line transparency overlay (Figure 1c). Discuss how even though the number of lines has been reduced, having so many lines in a row might still make it difficult to distinguish which line is which.
- Replace the eleven lines with a ten-line overlay, representing our grand staff (Figure 1d). Now the student experiences the grand staff representing the middle of our pitch range, and immediately a conversation can be had about ledger lines as well. The center line that was removed does still exist but is unseen and is represented by a shortened version (the ledger line) to aid reading.

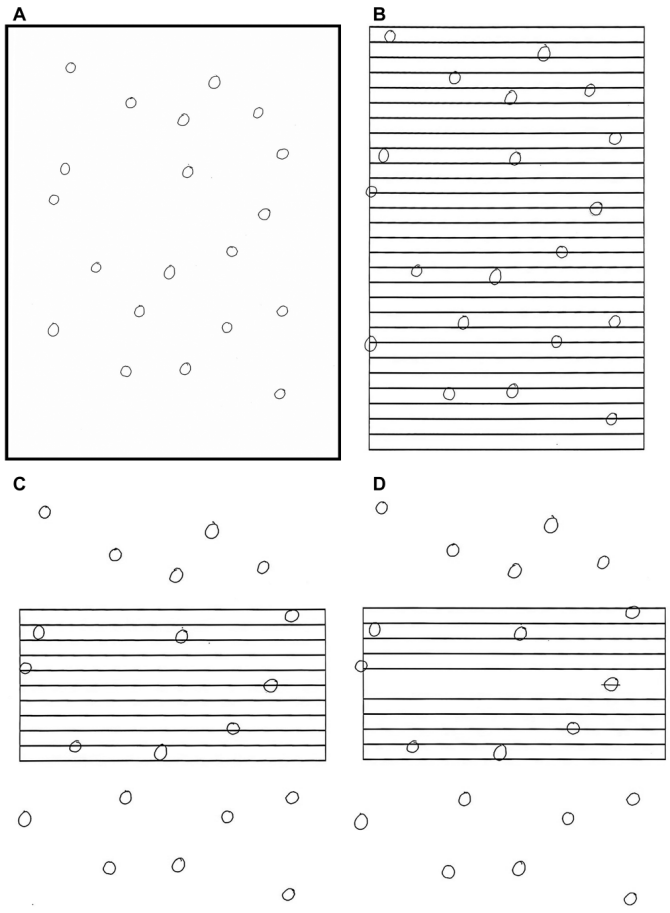

Figure 1. (A) Pitch correspondance bubbles. (B) Full-page lined transparency. (C) 11-line transparency. (D) 10-line transparency.

Prior Learning and Defining Terminology

When teaching a new language such as music reading, we must be aware of the presence of prior knowledge. Prior knowledge can be a major source of confusion. In James E. Zull's book, *The Art of Changing the Brain*, we are reminded of the importance of previously created neuronal networks in new learning.

> First, prior knowledge is a fact . . . Learners do not begin with a blank slate. Secondly, prior knowledge is persistent. The connections in physical networks of neurons are strong . . . Third, prior knowledge is the beginning of new knowledge. It is always where all learners start. They have no choice (Zull 2002, 93).

Here is how prior knowledge creates confusion. When students hear a familiar term with a previously learned

definition, they may not understand the context of the word in the new learning. For example, hearing the term "pitch." If the student just came off the playground, and they hear the teacher saying, "the pitch is too high or too low," the student may be envisioning a pitcher on the mound throwing to the batter. We, as teachers, must always ensure that all terms used in teaching have been clearly defined before we use them. Confusion could also occur with terms such as "stem," "note," "scale," "staff," "measure," and "beat," for example. It is essential that as we are introducing this new musical language, all pertinent terms are clearly defined and reviewed. We must ensure that the student is not relying only on previously learned knowledge to make sense out of a new vocabulary.

Preparation for Note Reading

To build neural pathways, instruction must always be explicit. The teacher should never assume that the student will make connections themselves. Research has shown that dyslexic students can be disoriented by the geography of the staff (Jaarsma, Ruijssenaars, and Van Den Broeck 1998). The next example (Figure 2) is an exercise that gives the student the language for navigating and defining location on the staff. Each line and each space are given a name. "Naming" gives the staff lines and spaces concrete identities. Once these names are learned, students are provided a series of noteheads, and students are asked to identify exactly where each notehead exists, i.e., space 1, line 4, space 2, space 3, and so on. The student uses the top part of the worksheet to practice naming lines and spaces, and then the bottom to define locations by naming and touching the spaces and lines, reinforcing notehead geography tactilely.

Introducing Pitch Names and Locations

When I work with struggling music readers, I assess their skills by providing a three-octave scale extending through the grand staff. I tell them the first space in the bass clef is *a* and ask them to touch and name all the notes ascending. Most are unaware that by reciting the alphabet from *a* to *g* three times, they can immediately name all notes on the grand staff. This is empowering for these students to learn. Although at this point they do not have reading skills, this piece of knowledge sets the stage for further understanding the structure and nature of the staff.

To develop reading skills, I introduce one pitch at a time beginning with pitch *a* (based on prior knowledge—the alphabetic principle). I only introduce a new pitch when the previous pitch has been mastered. To teach a new pitch,

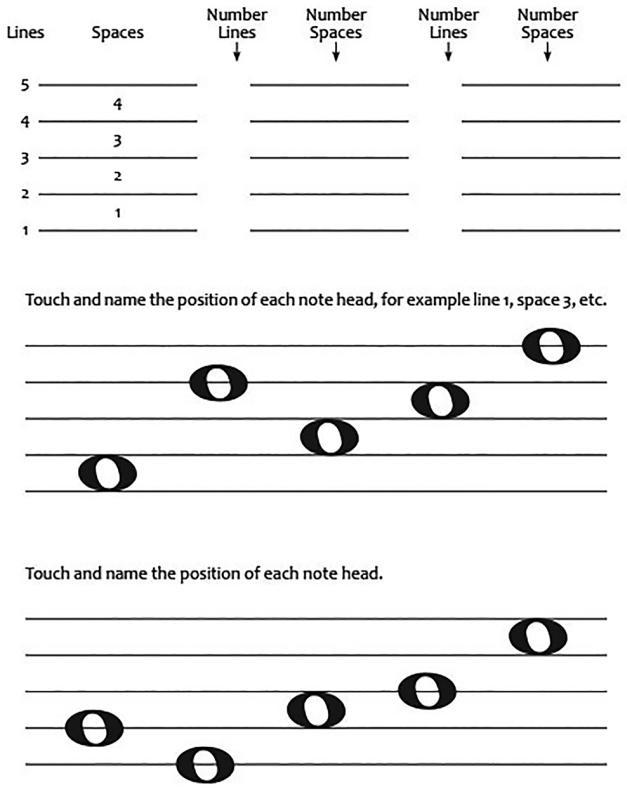

Figure 2. Staff geography.

I show the student (who has already been introduced to registers and clef signs) a flash card with the new pitch in their instrument's clef and have them define the geography of the pitch on the staff as described above, for example, for pitch *c*, "bass clef, space two." Then I present a Grand Staff Octave Chart (GSOC) (Figure 3a). Viola students can be aided by a three-octave alto clef reference sheet (Figure 3b). I have the student locate the pitch on the GSOC based on the learned geography and then have them identify the octave in which the pitch resides. Because they are learning the octave as well as the note name, each pitch has a unique name and identity. A dyslexic violinist that I worked with said that this knowledge of the unique octave number cleared up years of confusion and misunderstanding as to why there existed multiple pitches with the same name. Finally, I have the student practice drawing and naming the pitch on staff paper. When the student successfully accomplishes these tasks, they are ready to practice reading the pitch on their instrument.

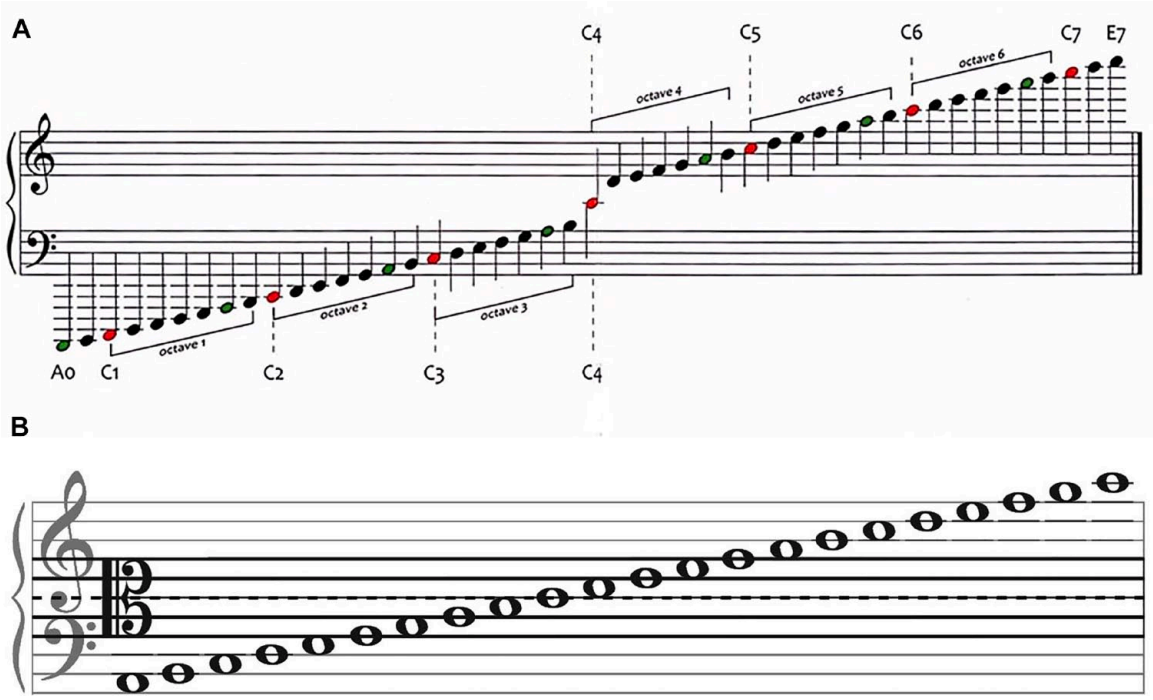

Figure 3. (A) GSOC. (B) Alto clef reference sheet.

Introducing Duration

One of the biggest challenges of reading music notation is the fact that each notehead provides two important pieces of information, pitch and duration. Deciphering duration can be particularly confusing for students because notes can appear so similar to one another: a combination of hollow or solid noteheads, stems or no stems, and flags or no flags in seemingly random configurations. For students with disabilities, we begin with the one duration that is unique: the whole note. The whole note is not stemmed, and therefore it cannot be confused with any other duration. As we move through the fractions, one change happens at a time: Add a stem for half notes, fill in the notehead for quarter notes, and add a flag for eighth notes. Most importantly, especially for students with dyscalculia, all durations can be introduced and defined sequentially and fractionally in relationship to the whole (half, quarter, eighth, sixteenth, etc.). Students with disabilities often have difficulty identifying and naming rests. When initially discussing duration, rests are introduced as a newly defined concept—the absence of sound. Then individual rests are presented with the corresponding duration, are reinforced with drawing and naming exercises and flash cards, and are practiced with equal exposure to the notated duration.

The whole note can be introduced with a chart that demonstrates visually where the beats lie within the whole note. Thereafter, each new fraction of the whole can be introduced using transparency overlays, always reinforcing the relationship of each duration to the whole, and visually demonstrating the sustained nature of sound from bar line to bar line and from beat to beat (Figure 4a–d).

Sequential and Cumulative Order of Instruction

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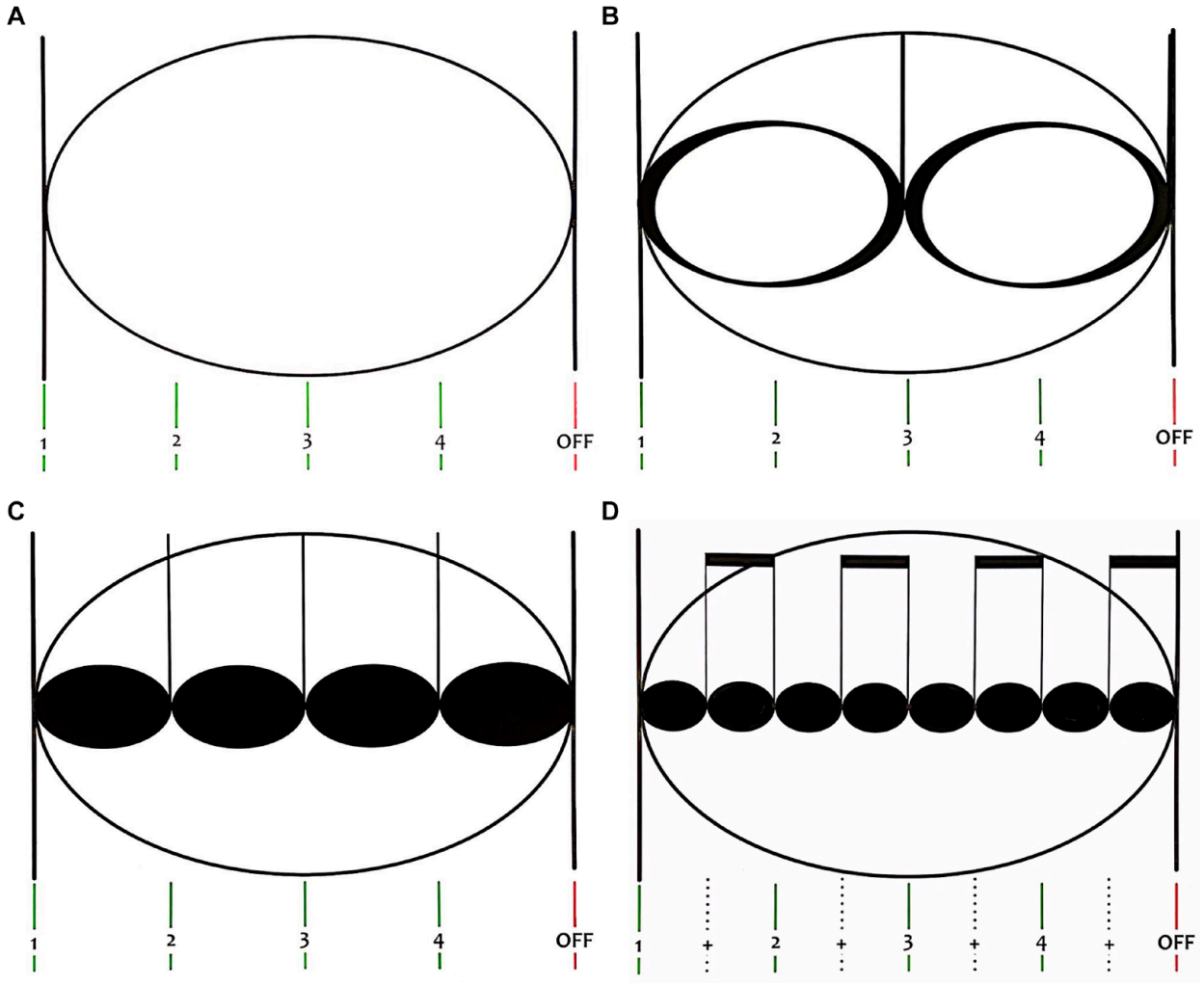

Figure 4. (A) Whole note graphic. (B) Half note transparency overlay. (C) Quarter note transparency. (D) Eighth note transparency.

foundation, with an emphasis on understanding all aspects of the staff before they begin the reading process. To achieve this, it is necessary to teach only one concept at a time. It is important that pitch and rhythm are taught separately until basic beginning skills are understood and mastered. Once students have a strong understanding of pitch and rhythm (reading mastery of the first initial three pitches without rhythm, and whole, half, and quarter notes and rests on one pitch only), the student begins to read combined pitch and rhythm. For students with disabilities, combining identification of pitch and rhythm simultaneously is double the processing effort, so this skill be introduced more simply and slowly than processing individual skills, beginning with the first two pitches *a* and *b*, and whole and half notes and rests. We must be certain that basic staff knowledge, pitch identification, and rhythmic notation are solidly understood as we begin to combine skills.

Multisensory Instruction

Good multisensory instruction for students with disabilities has several components. For example, instead of just seeing a group of learned notes on a page and playing them, the student will first interact tactilely with the page, touching while simultaneously naming each note, marking beats in the measure, and then vocalizing the rhythm with the metronome while touching the beats and naming the notes. When these skills are mastered on a particular measure, line, or page, the student is ready to take it to the instrument. This would be an example of analytic learning, akin to reading and processing

written language.

The next step is having the student take brief measures of dictation, based on what they have learned to read so far. For pitch geography, the teacher plays a particular group of notes while naming the pitches, and the student responds by drawing and naming the pitches on staff paper. This is not an oral skill or sight-singing activity, although pitch is included. The point is that the student can recreate named pitches on the staff correctly. Next, the teacher dictates a short rhythm performed with a metronome and the student draws it on a blank staff, marking the beats to reinforce the rhythmic values. This is an example of synthetic learning, akin to writing and spelling written language. Both analytical and synthetic approaches are necessary to stimulate strong neural pathway development.

Repetition and Review

Once new information is taught, we cannot assume that students will have automatic memory access to that information, even if they appear to have understood it. Students with learning disabilities often have weak memory skills, so we aim to build the neural networks that support complete understanding and knowledge rather than rely on memorization. Every newly learned skill or piece of information must be reviewed and repeated until the student can consistently demonstrate mastery. Definition cards and flash cards can provide the reinforcement students need to solidify mastery of previously learned skills. Review cards include pitch cards with name and octave, symbol cards, durations, rests, and definition cards.

Conclusion

The National Center for Education Statistics estimates that, in 2021–2022, 15 percent (7.3 million) of all public-school students were eligible for special education and related services, and of that number, 32 percent were in the category of "specific learning disability," which includes disorders that manifest themselves as an imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations (National Center for Education Statistics 2023). These numbers represent students who have been identified as LD and are being academically accommodated. How many students beyond that have not been identified? When students enter private studios or music classrooms, they bring these learning challenges with them. It is imperative as a profession that we ask these questions:

- Have music education specialists thoroughly researched this issue?
- And what researched-based solutions have been provided to teachers so they know exactly how to help their struggling students?

We can look to decades of research into learning disabilities to find answers. It is my hope that this article will spur conversation and additional research so that all students have access to the world that reading music provides.

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