

What is Multisensory Structured Language?

by Judith R. Birsh

Learning to read, write and spell are cognitive linguistic tasks. Extensive research over the last decades has shown that teaching in these basic cognitive linguistic areas must include a language-based approach that is direct, systematic, explicit in content, and addresses the following foundational skills: phonemic awareness, phonics, fluency, vocabulary study, comprehension strategies, (NRP, 2000), spelling (Moats, 2006), and writing (Berninger & Amtmann, 2004), with an emphasis on accuracy and automaticity in every aspect. This kind of instruction is especially mandated for those who are at risk or are struggling to learn to read. For many students, learning to read is a painstaking process. They need every step of the way made crystal clear in order to fill in the gaps in their knowledge.

Beginning early in the 20th century, long before the use of sophisticated brain imaging techniques to illuminate the reading pathways, multisensory instruction formed the basis of treatment for diverse groups of students with reading difficulties (Moats & Farrell, 2005; Henry, 2006). We now know much more about the brain through work in the neurosciences. Brain imaging has allowed scientists to follow the pathways used in reading in both children and adults. As the science of reading has evolved, however, there has been a great deal of research on what causes reading disability and how to define it. What has not progressed at the same pace is sound, experimental research on treatment and instructional practices such as multisensory techniques. The absence of such evidence has not prevented educators from routinely prescribing and implementing multisensory practice combined with a structured language curriculum with their most severely dyslexic students. In fact, there has been a strong and growing interest in such techniques, with many teachers and administrators eagerly changing classroom practice to include explicit examples of simultaneous multisensory experiences in their reading instruction.

This description of multisensory structured language (MSL) has four purposes. The first is to explain what MSL is, using the typical lesson plan format as the framework for the discussion. The second is to propose reasons from clinical and classroom experiences, why MSL seems to work with children and adults with dyslexia and other reading challenges. The third part will look briefly at some experimental research that uses programs that contain components of MSL and work well with a variety of groups. The last part will describe the new IDA initiative on research into MSL.

A Potent and Powerful Pairing: Multisensory Teaching and Learning with a Structured Language Curriculum

Many experienced teachers who work with students with

dyslexia and related learning difficulties teach the scientifically based components of reading instruction, using a multisensory structured language program to insure learning of the cognitive linguistic concepts necessary for successful reading acquisition.

“Multisensory teaching is not lights, camera, action.” as one teacher has said. Multisensory teaching and learning is a form of direct instruction of the phonologic, morphemic, semantic and syntactic layers of language. Multisensory strategies simultaneously involve visual, auditory, tactile-kinesthetic sensory systems, and/or articulatory-motor components while linking listening, speaking, reading and writing; this means it directly involves students in seeing, hearing, saying and writing during instruction. For example, to teach a vowel sound, the teacher emphasizes visual awareness of the teeth, tongue and lips positions, and the kinesthetic feel of the sound in the throat while simultaneously having the student name the letter along with a key word to reinforce the sound/letter association. After instruction, direct application of the sound/symbol correspondences to reading and spelling are practiced using a variety of skills such as letter matching, blending words with the new sound, and analyzing words with the sound for spelling.

In each section of the lesson, teachers pay close attention to how they are going to involve different sensory systems to reinforce the learning in brief and varied routines that motivate students and hold their attention.

In their daily lessons, teachers deliberately and systematically incorporate many multimodal opportunities to hear, see, say, and move, while following a carefully organized and sequenced approach to language structure. Students handle a wide variety of manipulatives such as sound cards, sound boards, pocket charts, letter tiles, three-dimensional alphabets, dry-erase boards, blackboards, pencil grips, index cards, story and information books, notebooks and many styles of writing implements and textured surfaces to write on. New knowledge is accumulated, based on what has already been previously learned and then maintained for daily review and practice in future lessons. The power behind these strategies resides in the pairing of multisensory teaching and learning with the structured language curriculum.

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Abbreviations

IDA: International Dyslexia Association

MSL: Multisensory structured language

Lesson Planning is at the Heart of Multisensory Teaching and Learning

Essence of a Multisensory Structured Lesson Plan

The plan for an MSLE lesson includes a specific order of activities taught for a prearranged period of time so that all components of the structure of language are included each time the teacher meets with students. Conscious multisensory procedures using the student's eyes, ears, hands, and mouth help to link the sound, sight, and feel of the spoken language to the printed language on the page. (Adapted from Birsh & Schedler, 2005)

The salient features of what makes a lesson multisensory will be highlighted in the routines of a typical MSL lesson. "The core content for instruction is the carefully sequenced teaching of the structure and use of sounds, syllables, words, sentences, and written discourse." (Moats & Farrell, 2005). The lesson plan format includes a progression of structured, scientifically based, (NRP, 2000) language activities. The essential components are rotated through carefully planned lessons on a daily basis with differing emphases according to the needs of the students. In each section of the lesson, teachers pay close attention to how they are going to involve different sensory systems to reinforce the learning in brief and varied routines that motivate students and hold their attention. It is common for MSL trained teachers to engage their students actively in question-response-feedback cycles.

The multisensory lesson plan formats of the programs based on the original Orton-Gillingham approach have many common features. Programs that are similar in structure and philosophy have been developing since the 1970s. They adhere to the principles learned from research studies and clinical experiences with input from many allied professionals from the fields of education, psychology, neuroscience, medicine, and speech-language pathology (Birsh, 2005).

Programs accredited by The Alliance for Accreditation and Certification of Structured Language share the philosophy that effective MSL includes instruction that is explicit, systematic, cumulative, direct, and sequential). Some MSL programs are derived from the original Orton-Gillingham approach and bear the name of their authors, such as Slingerland, Sonday, Spalding and Wilson (For more programs see Baker Hill, 2005, p.609; Henry, 2005). Many emphasize different content areas of reading-related skills, depending upon the needs of the students they are designed to serve. This is reflected in the lesson plans of each program, which are variations on the same theme. Furthermore, programs based on the Orton-Gillingham approach present the building blocks of written language in a sequence that addresses phonemic awareness, sound-symbol relationships, phonics, syllable types, structural analysis, spelling, fluency, vocabulary, comprehension, composition and handwriting.

Daily lessons typically include the following discrete components of language, which are modified for each student

or group and for different levels of instruction. All components do not appear every day. They are rotated through the weekly lesson plans to help students develop fast, accurate decoding, automatic recognition of familiar words and sight words, and fluent reading of text, spelling proficiency, comprehension and writing.

- Alphabet sequence and letter naming.
- Phonemic awareness activities including segmenting and blending.
- Review of sound-symbol associations, learned in previous lessons using letter decks and key words to aid memory.
- Spelling dictated sounds to integrate reading and spelling.
- Introduction of new letter/sound associations and language concepts, and/or review of previously introduced concepts.
- Reading phonetically regular words in lists and sentences with letter patterns already taught, and developing automatic recognition of high-frequency sight words to build automaticity.
- Vocabulary study including Greek and Latin layers focusing on morphology and syllabication.
- Reading controlled and/or decodable text to develop fluency.
- Spelling and writing words and sentences from dictation using words from reading practice.
- Handwriting practice, with explicit instructions in letter formation.
- Comprehension and listening strategies for use with connected text.
- Oral language practice and written composition.

The structured lesson plans used in MSL intervention target these specific skill components with the ultimate goal of increasing accuracy and fluency through sufficient practice and synthesizing these skills for effective comprehension and written expression. The lesson plan following provides an example.

Lesson Plan Example with Multisensory Components

1. Alphabet/Phonological Awareness

Students touch and name the letters of the alphabet in sequence (tactile/auditory). Echo, discriminate and tap out individual sounds in spoken words. (auditory/kinesthetic)

2. Handwriting

Students name and trace the letter d three times while listening to guided stroke description. (auditory/kinesthetic)

3. Reading Deck Review

Students name previously learned letters and give the keywords and sounds. (visual/auditory)

4. Spelling Deck Review

Students listen to previously learned sounds, repeat sounds and write letters with index finger on tabletop. (auditory/kinesthetic)

5. Concept Introduction

Teacher provides multisensory introduction of a language concept using guided discovery of sound, with letter, key word and feeling of mouth positions, reinforced with sky writing, handwriting on paper, reading the sound and spelling the sound. (auditory/visual/tactile and kinesthetic)

6. Reading Practice

Students build words with syllable cards, blending syllables into words. (kinesthetic/visual/auditory)

7. Spelling

Students review the rule for doubling the final consonant (the Floss Rule) and checkpoints: 1) one syllable; 2) short vowel; and 3) final /f/, /l/ or /s/. Spell words: Look and listen; echo the word; write naming the letters; proof read. (auditory/kinesthetic/visual)

8. Extended Reading/Writing

Goal is accuracy, fluency and comprehension. Students read aloud from connected decodable text with controlled vocabulary geared to the students' level. Students write sentences using vocabulary they have been reading and spelling. (visual/auditory, kinesthetic)

9. Oral Language Practice

Students practice expanding sentences orally starting with basic simple sentences and use cards to represent parts of speech in sentences. (auditory, visual, kinesthetic)

10. Listening

Teacher reads expository texts of interest to students at their level of comprehension. Uses comprehension strategy such as think-aloud K-W-L, a structured graphic organizer (Marzola, 2005). (auditory/kinesthetic/visual)

From Carreker, S. (1998). Basic language skills: Concept manual, book one (p. iv). Bellaire, TX: Neuhaus Education Center; adapted by permission.

What May Make Multisensory Instruction Effective

As the science of reading has evolved, there has been a great deal of research on reading development, aspects of reading instruction, and what causes reading disability. What has not progressed at the same pace is sound, experimental research with empirical evidence lending theoretical support to specific multisensory instructional practices for reading-related disorders.

Despite long-term use of multisensory techniques by experienced practitioners for students with reading difficulties and the number of well-established instructional programs incorporating them as central to their design, very little is actually known about the efficacy of multisensory instruction. "Although devoted practitioners emphasize the significance of the multisensory component as pivotal for student success, it is perhaps this component that is least understood..." (Moats and Farrell 2005).

Moats and Farrell (2005), however, provide some insights into why MSL is effective in language learning. Careful to note

the lack of empirical evidence to support the power of the approach, they, nevertheless, see some theoretical support coming from the science of cognition and neuroscience. This is not familiar territory for most teachers. However, because of the emerging popularity and current adoption of multisensory activities for intensive instruction and within the classroom, many will want to know the theoretical basis for these activities.

Three different areas of research offer support for multisensory instruction. The first area is in the nature of memory; the second area comes from the neurosciences; and the third, from the nature of learning (Moats & Farrell, 2005).

Functional neuroimaging has allowed researchers to understand how reading takes place in the brain and how language is processed there.

Research concerning short and longterm memory finds that the neural networks are temporarily activated during new learning. Focusing on specific pieces of information holds learners' attention when control processes are used. For example, "selective attention, attentional shift, and employment of strategies for remembering such as verbal rehearsal or use of imagery are features of working memory as well." (Moats & Farrell, 2005). Selective attention is the ability to attend to certain stimuli while ignoring other stimuli, and working memory involves putting ideas on hold while working on other ideas or taking in new information. Storage mechanisms that store small pieces of speech information and graphic or print information are active in working memory. In a study cited by Moats & Farrell, (Mousavi, Low, & Sweller, 1995), it was found that integrating in working memory what is being learned is more easily done when the material is physically conjoined through both the visual and auditory modalities. For children who show evidence of phonological disability with difficulty in sorting out speech sounds and storing them accurately in phonological memory, improvement in phoneme awareness, reading and spelling came as a result of working on the "articulatory features of the phonemes and phoneme sequences in words" (Moats & Farrell, 2005) combined with the written representations (Gillon, 2003).

Functional neuroimaging has allowed researchers to understand how reading takes place in the brain and how language is processed there. Reading involves multiple sites and has multiple systems for processing the symbols into sounds. Dyslexia is manifested by a disruption in these language systems, which leads to phonological weaknesses. The phonologic weakness occurs "At the lowest level of the language system," and in turn impairs decoding (Shaywitz, 2003). In fact, there are two neural systems for reading: one for word analysis in the parieto-temporal region and the other for automatic, rapid responses localized in the occipitotemporal area that is used by skilled readers for rapid word recognition. Low phonological

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processing skills are the result of left hemisphere posterior processing anomalies typical of children with dyslexia (Birsh, 2005). This means that individuals with dyslexia have difficulty accessing and manipulating the sound structure (phonemes) of spoken language. Such a deficit prevents easy and early access to letter-sound correspondences and decoding strategies that foster accurate and fluent word decoding and recognition.

Although these differences affect the ability to read, neural systems for reading are malleable and highly responsive to effective reading instruction. In their research using functional magnetic resonance imaging to study the effects of a systematic phonics-based intervention with 6- to 9-year-old children, Shaywitz and Shaywitz (2004) found evidence of plasticity of neural systems for reading. The changes in the brain made these readers comparable to good readers. "Teaching matters and can change the brain." (p.931).

Although differences in individuals with dyslexia affect the ability to read, neural systems for reading are malleable and highly responsive to effective reading instruction.

It is possible that dyslexics can compensate for this neural disruption with the help of multisensory components within the lesson taught. Moats and Farrell, (2005) propose that when alternative circuits are engaged in order to circumvent those that are weak for developing phonological processing skills by activating sensorimotor pathways when using "fingertips, hand, arm, whole body, and/or vocal; speech apparatus during symbolic learning, that circuits for word recognition are more easily accessed and established" (p.32).

The third area of support for MSL comes from clinical evidence of successful instructional approaches over the years. In working with students with learning difficulties, clinicians and classroom teachers have found that the most successful interventions are carefully constructed with special attention to linking old and new information, reinforcement of what they know through multiple opportunities for practice and review, and the use of ready responses between teachers and students along with acknowledged specific strategies for solving linguistic conundrums. Active learning is the key concept. Teachers accomplish this by using a conscious set of metacognitive strategies to group, rearrange, and transfer topics of information using a common language to refer, for example, to types of syllables, steps in a story map, or ways to spell the sound /o/. Moats and Farrell (2005) also suggest that creating mnemonic strategies such as using key words, chunking, rhyming, visualizing and grouping related facts tends to help students remember better than when given ready made ones. In addition, students who use verbal rehearsal while working remember more and are more accurate. Using a motoric response while

learning something new leads to better attention to detail and better retention of what is being learned.

Teachers See Benefits of MSL

Experienced teachers and clinicians have known about the benefits of MSL for a long time. Most importantly structured lesson planning ensures that teachers include all levels of language in the same session as well as ample opportunities to incorporate instances of multisensory instruction. Because of the variety of modalities and media, and the consistency of the approach, teachers experience enthusiastic interaction with their students, helping them establish a positive rapport.

MSL is based on teachers using a well-defined scope and sequence so that there is systematic introduction of new information in small steps for the precise teaching of skills (Cox, 1992). This feature promotes the use of guided discovery through Socratic questioning to learn new language concepts based on what the students already know. "When students make a discovery, they understand and connect the new learning to prior knowledge." (Carreker, 2005) The guided discovery instructional process is an essential aspect of MSL; one that sets it apart from whole language instruction and balanced literacy. The basic steps in multisensory guided discovery teaching can be used at every level of language instruction. Here is an example of how it can be put into practice:

- The teacher reads words aloud that contain a common element with the student repeating each example. (auditory/kinesthetic)
- Students discover the new language element that sounds the same in each word.
- Students then see the words written on the board. (visual)
- Students discover the common element that is the same in each of the words by looking at them (visual) and its position. (visual)
- Students say out loud what they have discovered. (auditory/kinesthetic)
- Teacher makes a card with the new element to add to a review deck. At the same time the students name the element, spell it, give it a key word to aid recall, and assign a meaning to it if it's an affix, for example. They then add the information to their language notebook. (visual/auditory/kinesthetic/tactile)

In place of rote memorization, teachers and students engage in metacognitive dialogues about pertinent strategies. Teachers and students develop together a consistent language about concepts that need to be taught directly. For example, in the Wilson Reading System (Wilson, 2002), questioning techniques are used throughout the lesson after introducing new material to assure that the student has understood. Students justify their choice of strategies based on what they have just learned. Such terminology as digraph, blend, syllable, and schwa sound gives students and teachers a common vocabulary to discuss

new concepts, review what they have learned and to make corrections themselves.

Multisensory Teaching and Learning from the Students' Point of View

From the students' point of view, MSL lessons fit their need for structure, limits, and an anxiety-free atmosphere in which to learn. Students do not like surprises or last-minute changes that can confuse them and affect their performance. The agenda of the lesson plan is often displayed using words and symbols for the activities listed. Students and teacher refer to this schedule as the lesson progresses. There is less anxiety because the daily presentation of activities occurs in the same order so students know what to expect and when. MSL lessons adhere to a daily structure to ensure that students feel secure in knowing that the lesson is stable and predictable, and that it is designed for their success. Student attention is better focused because the activities rotate rapidly, none lasting more than about ten minutes. They are frequently surprised at the fast pace and amount accomplished at the end of the session. By verbalizing, generalizing, comparing and contrasting language elements, their active participation increases as they build the structure of language for themselves (Birsh & Schedler, 2005).

MSL lessons adhere to a daily structure to ensure that students feel secure in knowing that the lesson is stable and predictable, and that it is designed for their success.

Visual reminders in the form of procedure charts are frequently used for laying out the steps for spelling, making letter shapes, punctuation reminders, or story maps to prompt students to use strategies they have learned without the necessity of verbal repetition from the teacher.

Careful planning guarantees that all aspects of language are practiced and integrated systematically, based on an organized curriculum. This seamless presentation assures students that the basic skills needed to become skilled readers are not presented in a disjointed, disconnected way. Students participate in short, intensive, interactive activities that integrate reading, writing and spelling. What they read they write; what they write they read; what they read they spell. They are learning while using all pathways to learn in every lesson.

Grasping written language concepts presents difficulties, especially when attention is a problem. Therefore, activities are short and focused with small steps taken in sequence, at first easy and then more difficult. With the rapid changing of learning modalities (visual, auditory, and tactile/kinesthetic) and media, teachers keep the lesson interesting. Students learn to accept and even anticipate variety within the structure (Tucker, 2003).

Necessary repetition builds toward mastery while all taught concepts are maintained in the lessons (Wilson, 2002). New learning and practice with prior learning are well balanced. Review is automatically built in for purposes of fluency and

automaticity of the essential components of reading and writing.

As students gain mastery of the sub skills, teachers continue to introduce new content in the curriculum sequence. Some students take longer to reach mastery during remediation. However, the strong organization of well-planned MSL lessons often helps students improve their memory over time, and thus have better retrieval of information. Furthermore, teachers find that these techniques engage their students while encouraging them to think about the structure of language in ways that may have been inherently difficult for them.

Research Studies Use Intensive, Systematic, Structured Language Instruction for Children and Adults

There are a number of recent studies that show that following intensive, systematic, structured language teaching with many instances of multisensory elements incorporated into the programs, children and adults with reading disabilities demonstrated normalized brain patterns to aid their word recognition (Blachman, Schatschneider, Fletcher, & Clonan, 2003; Eden et al., 2004; Shaywitz, 2003; Simos et al., 2002). However, the research does not support within the research protocols the multisensory components of structured language lessons emphasized by teachers who use MSL. This lack of evidence, in light of what is already known about the science of reading, has provided a challenge to adherents of MSL to seek evidence to support their use of such principles of instruction. Moats and Farrell (2005) put these concerns into perspective:

"Although many of the programs incorporating these strategies have been effective according to clinical reports, the specific contribution of the multisensory component to the overall success of those programs has not yet been thoroughly documented or explained through rigorous manipulation of instructional conditions and subsequent measurement of outcomes. Current reading research, however, does offer strong support for the content and overall approach of MSLE programs because they address language processing skills necessary for both decoding and comprehension." (p.29)

The International Dyslexia Association Initiative on Research in Multisensory Teaching and Learning

Recognizing the need first for a consensus on a definition of multisensory teaching and learning and its theoretical frameworks based on scientific evidence, The International Dyslexia Association (IDA) has created the Multisensory Instruction Research Initiative to stimulate scientific investigation into how the components of multisensory teaching and learning might or might not enhance the learning of reading-related skills. This initiative has adopted scientific investigation of multisensory teaching and learning in literacy acquisition as its major agenda.

Although the value of its clinical and classroom use has been known for over 75 years for students with dyslexia and other struggling readers, the true nature of its efficacy and an understanding of its individual components and subcomponents have yet to be given scientific scrutiny. Studies on the multisensory aspects of the interventions and remediation work

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with students are needed to provide the missing evidentiary link. In other words, studies are needed to determine what is the value of the multisensory aspect of the MSL approach when combined with evidence-based instruction that directly and explicitly addresses the multiple components of oral and written language in an integrated, systematic and cumulative approach with various populations of learners including those with dyslexia. The new grant program will provide funds for research projects focused on multisensory instruction. For information on this new initiative go to the IDA web site at www.DyslexiaIDA.org.

In summary, research supports the general conclusion that knowledge of the structure of language, systematically and explicitly taught and learned within a complete lesson framework that focuses on fluency, is important for beginning and struggling readers. However, there is no scientific evidence behind the multisensory component, emphasized by practitioners of multisensory structured language education, and central to programs derived from the principles of Orton-Gillingham instruction. Yet, its efficacy has been demonstrated over and over again for students with dyslexia and other struggling learners in independent and public school contexts as well as in clinical settings (Joshi, Dahlgren, & Boulware-Gooden, 2002). The need for discovering what Dr. Gordon F. Sherman, chair of the Multi-sensory Instruction Research Initiative, calls “the mysteries of multisensory teaching and learning” in light of the broad implications for instruction in this nation’s public schools, which have come to rely on evidence-based instruction, brings a new urgency to the Multisensory Instruction Research Initiative at IDA.

The principles of multisensory teaching and learning rest on a bedrock of decades of clinical and classroom experience as the approach of choice for reading instruction for students with dyslexia. The emphasis on the basic language components of a comprehensive program along with the application of direct, intensive, and systematic instruction parallels the consensus derived from the science of reading on what and how to teach reading to beginners and those struggling to learn. The future promises new knowledge and information based on scientific evidence that will test the efficacy of the multisensory components deemed essential in multisensory teaching and learning.

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