Occupational Therapy for Literacy Development

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Getting to Know You!

- Years of practice experience?
- What age groups of children do you see in your schools?
- How many children on your caseload have literacy problems?
- How many are addressing literacy IEP goals related to writing?
- How many are addressing literacy IEP goals related to reading?
- What questions do you have about OT and literacy today?

Literacy

- The ability to construe a written, linguistic, alphabetic symbol system (Colorado Academic Standards, 2010).
Why do we need to understand 
Literacy in the Schools

- Supports educational participation, an occupation according to the OT Practice Framework (AOTA, 2014).
- Common Core Standards provide clear expectations for English language arts and apply to ALL students.
- Response to Intervention & Positive Behavior Intervention and Supports
- Literacy Achievement
- Literacy is not just about skill, it is also about occupation.

Literacy is embedded in all areas of occupational performance

- Job applications
- Reading assembly directions
- Driving
- Reading maps
- Product labels
- Bus schedules
- Game scoreboards
- Videogame instructions

When understood as an occupation, literacy easily fits into the occupational therapy domain of practice.
Occupational Analysis of Writing…

- Person
  - Meaningfulness
  - Body mechanics
  - Sensory readiness
- Task
  - Just right challenge
  - Modalities/Tools used
  - Assistive Technology
- Environment
  - Lighting
  - Distractions

Meaningful Participation!

- OT’s are not the handwriting teachers!

NCLB
Reading: A complex system of deriving meaning from print.

Essential Components of Reading Instruction:

- Phonemic awareness
- Phonics
- Vocabulary
- Fluency
- Comprehension strategies
Reading as an Occupation

- World Federation of Occupational Therapists
- Everyday activities that people do as individuals, in families and with communities to occupy time and bring meaning and purpose to life. Occupations include things people need to, want to and are expected to do

Occupational Analysis of Reading

Why do we need to understand Literacy

- Writing and Reading are inter-related!
• Literacy involves Language
• No organ of its own, teams up with the sensory and motor systems.
• Draws on common and unique brain processes to achieve different goals.
• Are separable skills yet inter-related skills.

Writing’s Influence on Reading
Writing words influences reading skill at all grade levels.
Writing text or essays influences reading in the upper elementary years.

How does early writing influence early reading?
Directing attention to print.
Attending closely to features of letters.
Constructing words from single phonemes or clusters.
Building the vocabulary bank.
Awareness of construction of sentences.
**Reading’s influence on Writing**

Working with children to read will influence their writing skills at all grade levels.

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**Workshop Components and Objectives**

<table>
<thead>
<tr>
<th>Components</th>
<th>Objectives</th>
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<tbody>
<tr>
<td>1. The Development of Literacy</td>
<td>• Understand the development of reading in school-aged children.</td>
</tr>
<tr>
<td>2. Reading Difficulties</td>
<td>• Define Reading Difficulties.</td>
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<tr>
<td></td>
<td>• Describe neuroscientific theoretical perspectives that define reading difficulties.</td>
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<tr>
<td>3. Assessment of Reading Difficulties</td>
<td>• Read and understand an assessment report of reading as a skill.</td>
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<td></td>
<td>• Discriminate between skill and occupation-based reading assessments.</td>
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<td></td>
<td>• Identify signs of reading difficulties using an occupational participation perspective.</td>
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<tr>
<td>4. Defining the Role of OT in Reading Intervention</td>
<td>• Discuss an occupation-based perspective to reading intervention.</td>
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<td></td>
<td>• Discuss strategy development to help children increase reading participation.</td>
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Part 1

THE DEVELOPMENT OF LITERACY

Understanding Language and Literacy: The 30 Million Word Gap (Hart & Risley, 1995)

- Groundbreaking study that changed the way early language and literacy development is understood in the present day.
- 3 year observation of 42 families in Kansas City, 1 hour each month.
- Children from 7 months till they were 3 years of age.
- Divided the families into 3 SES: professional, working and welfare families; multi-racial.

Stages of Literacy Development

- Preliteracy (precursors to language development)
- Emergent Literacy (early use and understanding of language)
- Early Literacy (precursors to reading and writing skills)
- Conventional literacy (actual skills of reading and writing)

(Dunst, Trivette, Masiello, Roper & Robyak, 2006)
How Literacy is Learned

<table>
<thead>
<tr>
<th>Stage of Literacy</th>
<th>Primary Goals</th>
<th>Literacy Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preliteracy</td>
<td>Development of vision, hearing and speech abilities through play</td>
<td>Parents and other family members</td>
</tr>
<tr>
<td>Emergent Literacy</td>
<td>Refinement and integration of vision, hearing and speech to produce meaningful language</td>
<td>Parents and other family members; day care instructors</td>
</tr>
<tr>
<td>Early Literacy</td>
<td>Learning the alphabet; early development of writing; increasing interest for books; writing name learning sight words</td>
<td>Family; preschool teachers</td>
</tr>
<tr>
<td>Conventional Literacy</td>
<td>Writing words and sentences; increasing vocabulary bank; learning pace and speed in reading; understanding reading</td>
<td>Elementary teachers; family</td>
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</tbody>
</table>

In detail:
Learning a Code (Clay, 2001)

Between 3-4 years of age children begin understanding of writing and reading as a code:

- Made up of special marks.
- Placed in a certain order.
- Makes a recognizable pattern.

What are early signs of possible literacy challenges?

- Lack of interest during reading time.
- Language delays.
- Difficulties tracking pictures and letters.
- Letter confusion and difficulties naming letters.
- Difficulties writing letters on demand.
- Consistent letter reversals.
- Difficulties with easy sight words.
- Avoidance and anxiety during reading.
Part 2

READING DIFFICULTIES

A Look at Learning Disabilities and Reading Difficulties in the U.S.

- Up to 5% of public school students have been diagnosed with specific learning disorders.
- Up to 15% more are undiagnosed and can fall into the cracks.
- Up to 69% of 4th graders with SLDs will perform Below Basic Level in Reading.

(National Center for Learning Disabilities, 2014)

Dyslexia and Reading Difficulties

- Dyslexia is characterized by an unexpected difficulty in children and adults who otherwise possess the intelligence, motivation, and schooling considered necessary for accurate and fluent reading (Shaywitz et al., 2001).
- Typical intervention focuses on phonological processing and fluency.
- 30% of children with dyslexia do not have expected phonological deficits or do not respond to phonology-based remediation (Laycock & Crewther, 2008; Ramus, 2003; Wolf, 1999; Wright & Conlon, 2009).
DSM V Terminology

- Specific Learning Disorders with difficulties in reading.
- Impact of reading daily living, school and work participation.

(American Psychiatric Association, 2013)

Dysgraphia (Deuel, 1995)

- **Motor Dysgraphia**
  - Poor fine motor skills and dexterity
  - Good spatial orientation
  - Good spelling

- **Spatial Dysgraphia**
  - Good fine motor skills and dexterity
  - Poor spatial orientation
  - Good spelling

- **Dyslexic Dysgraphia**
  - Good fine motor skills and dexterity
  - Good spatial orientation
  - Poor spelling

Perspectives in Dyslexia

Dyslexia

- Phonology and Language
  - Holistic, integrative, context-specific approach to literacy? (National Reading Panel, 2000; Al Otaiba & Fuchs, 2006)

- Reading Specialists, SLPs, Special Ed Teachers

- ?
A Cascade of Deficits

- Dyslexia
  - Double-deficit Hypothesis
  - Magnocellular Theory

OT in Dyslexia

Phonological Deficit in Dyslexia

- Phonological deficit is the core of reading failure (Vidyasagar & Pammer, 2008).
- Children with phonology deficits overwork the language and auditory centers of the brain.

Phonological Deficit in Dyslexia

[Brain diagram with labeled areas: Broca's area, primary motor cortex, supramarginal gyrus, angular gyrus, primary auditory area, Wernicke's area]
Phonological Deficit:
Clinical Presentation

- Difficulties processing letter sounds and letter combination sounds.
- Each word encountered is dissected at the letter-sound level.
- Difficulty manipulating letter sounds to form new words (e.g. C-A-T → C-A-R-T)

Double-Deficit Hypothesis

- Cerebellum is the auto-pilot center of the brain.
- Faulty connections from the cerebellum to the auditory, language, motor, sensory and visual centers lead to an automaticity deficit in reading.

(Wolf & Bowers, 1999)
**Double-Deficit Hypothesis: Clinical Presentation**

- Slow with naming letters, numbers, colors, objects during testing and activities.
- Require more time in reading sight words, even those that are already familiar.
- Slow processing speed of auditory and visual information.

**Magnocellular Theory**

- Magnocellular laminae – a ganglion of cells located in the lateral geniculate nucleus, visual cortex (occipital lobe) and posterior parietal cortex of the brain (Schulte-Korne & Bruder, 2010).

- A deficient visual magnocellular system plays a critical role in learning automatic reading in children.
Magnocellular Theory

Magnocellular Theory: Clinical Presentation

Magnocellular Deficiency: Visual Orthographic Skills

/ight/
light
right
sight
Visual Orthographic Processing
Difficulties: Clinical Presentation

- Children do not automatically associate the visual letter presentation (e.g., /ight/) to the sound and spelling of the word (e.g., light) making it difficult to write and spell the word.
- Reversing letters (b and d most common)
- Spelling words the way they sound.
- Difficulty retaining sight words
- Reversing order of letters (From vs Form)

Dyslexic Dysgraphia:
Visual Orthography deficits

Review: Skills-based Perspective

<table>
<thead>
<tr>
<th>Theory</th>
<th>Skill Deficiency</th>
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<tbody>
<tr>
<td>Phonological Deficit</td>
<td>Language and Phonological Processing; Auditory Processing</td>
</tr>
<tr>
<td>Double Deficit</td>
<td>Processing speed; Skill Automaticity</td>
</tr>
<tr>
<td>Magnocellular Deficiency</td>
<td>Processing speed; Reading automaticity; visual orthographic processing</td>
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Part 3

ASSESSMENT OF READING DIFFICULTIES

Classical Approach

- Why is the child slow with reading?
- What skills are deficient?
- How deficient are the language skills?
- How fast and accurate is the reading?
- Is comprehension affected?

Occupational Participation Approach

- How does the reading difficulty affect participation and performance of important occupations?
- What contexts support or hinder participation in reading?
- What are the child's interests, motivations and preferences in terms of reading participation?
- How does the reading difficulty impact various occupational roles?

Reading Assessment

Assessment of Reading Difficulties: Classical Approach

Reading ability testing
- Reading accuracy (correctness) and rate (speed).
- Fluency (accuracy and rate).
- Reading and Passage comprehension (answering questions; deriving contexts from pictures).

Component skills testing:
- Language and Phonological processing abilities (decoding letters, words, pseudowords)
- Vocabulary
- Intelligence tests
Classical Assessments

- Test of Word Reading Efficiency, 2nd ed (TOWRE-II; Torgesen, Wagner & Rashotte, 2012)
- Gray Oral Reading Test, 5th ed. (GORT-5; Wiederholt & Bryant, 2012)
- Woodcock Reading Mastery Test, 3rd ed. (WRMT-3; Woodcock, 2011)

- Comprehensive Test of Phonological Processing Skills, 2nd ed. (CTOPP-2; Wagner, Torgesen, Rashotte & Pearson, 2013)
- Test of Auditory Processing Skills, 3rd ed. (TAPS-3; Martin & Brownell, 2005)
- Peabody Picture Vocabulary Test, 4th ed (PPVT-4; Dunn & Dunn, 2007)
- Peabody Individual Achievement Test, Revised (PIAT-R; Markwardt; 1997)

Test of Word Reading Efficiency

- Test of Word Reading Efficiency, 2nd ed (TOWRE-II; Torgesen, Wagner & Rashotte, 2012)
- Sight Word Reading
- Pseudo-word Reading
- Read as many words from the Reading Card in 45 seconds.

Gray Oral Reading Test

- Gray Oral Reading Test, 5th ed. (GORT-5; Wiederholt & Bryant, 2012)
- Child is asked to read a short passage and answer questions about the passage.
- Rate – speed of reading
- Accuracy – correctness; no errors
- Fluency (Rate + Accuracy)
- Comprehension – ability to answer questions.
Woodcock Reading Mastery Test
- Woodcock Reading Mastery Test, 3rd ed. (WRMT-3; Woodcock, 2011)
- 8 subtest in 3 categories: Reading Readiness; Basic Reading Skills; Reading Comprehension
- Rapid Automatic Reading and Passage Comprehension → relevant to OT

Understanding Classical Reading Assessments
- Small Group Work:
  - Read a sample Reading Assessment.
  - Analyze the component skills being evaluated.
  - Write a short hypothesis of what are possible occupational impacts of these reading test results for this client?

Cascade of Performance-Related Deficits
- Dyslexia can affect
The Role of the OT

- Enabler of the occupational environment.

- Facilitates children’s development of strategies that will enable students to generalize and transfer reading skills.

- Support skills-based approach by the Reading Intervention Team.
From an OT lens, what does a child with reading difficulty look like?

● See Checklist: Signs of Possible Reading Difficulties

What assessments do you currently use for literacy-related challenges?

TASK ANALYSIS OF READING AS AN OCCUPATION

● Positioning
● Handling the tools of reading, books, electronic media
● Sensory regulation issues during reading time
● Analysis of the classroom reading environment
  ◦ Lighting
  ◦ Sound
● Supports and Modifications
● Contribute to understanding of component skill issues
  ◦ Visual Perception and Visual Motor Skills
  ◦ Test of Visual Perceptual Skills, 3rd ed (TVPS-3; Martin, 2006); Beery Visual Motor Integration Test, 5th ed; (VMI-6; Beery & Beery, 2006).
The Occupation of Reading

- A practice model currently being developed by Grajo and Candler of Texas Woman's University through a research at Saint Louis University.
- Reframes reading as a meaningful activity to fulfill student and various life roles.

Why a Paradigm Shift?

- Contexts of performance contribute to challenges that facilitate or hinder successful performance (demand for mastery).
- Anxiety overrides successful performance.
- Avoidance leads to inability to transfer learned reading skills.
- A direct performance skills approach does not necessarily translate to improved reading performance.

Why a Paradigm Shift: National Reading Panel Study, 2000

- Need for a more holistic approach to reading intervention.
- Language-based training alone should not constitute a complete reading program (p. 2-6).
- Literacy acquisition is a complex process.
- Need to look at impacts of motivation, engagement, interest, attention to make reading intervention optimal for students.
**Assessments**

- Multi-contextual
- Move from performance skills to performance areas – Top-down approach
- The emphasis is NOT on reading skills but participation and engagement in meaningful reading tasks.
- How do you feel about reading vs How well do you read?

**Occupation-based Assessment**

- Canadian Occupational Performance Measure (COPM; Law et al., 2005)
- “What kinds of reading at school, home or community do you want to be good at?”
- Importance
- Performance
- Satisfaction

**COPM**

- Importance
- Performance
- Satisfaction
Sample Reading Goals using COPM

Student 1:
• Read chapter books well.
• Read Lego Chima Books.
• Read fast in class.
• Read with friends for fun.

Student 2:
• Read story books.
• Read from a Kindle.
• Read well on my own.
• Read homework well.

Student 3:
• Read on my own well.
• Read homework well.
• Read harder story books.
• Read with mom well.
• Read at church in front of people.

Student 4:
• Read on my own well.
• Read homework well.
• Read harder story books.
• Read with mom well.
• Read at church in front of people.

Student 5:
• Read chapter books well.
• Improve spelling skills in class.
• Read MineCraft novel.
• Read better with friends.
• Read well on my own.

Occupational Assessment of Children’s Reading

● Efficiency and participation in reading activities.
● Contexts of Reading Performance
● Importance, Performance and Satisfaction
● Task objects used for reading
● Motivation, satisfaction, interest, feelings of self-competence

Contexts of Reading Performance

● Temporal (frequency; time; duration)
● Social (with who? Supports?)
● Physical (where? Which environments?)
● Personal (educational level? Access to resources? Developmental age and expectations)
● Cultural (literacy exposure)
● Virtual (technology-based mechanisms)
The Inventory of Reading Occupations (IRO)

A structured survey, interview and self-report tool for children from K-3 who struggle to read.

A 3-part outcome measure and goal setting instrument.

Theoretical Constructs of the IRO

- Emphasis on reading in context or functional reading (Stevenson, 1978).
- Uses an Occupational Adaptation perspective (Schkade & Schultz, 1992).
- Children who struggle to read perform less reading than the average reader (Kent, Wanzek, & Al Otaiba, 2012).
- Reading is difficult, anxiety-provoking and requires a lot of effort (Carroll & Illes, 2006; Kirby et al, 2011; Meltzer et al., 2004).
IRO Part 1: What and where does student read?

Asks about 17 categories of reading task objects.

Categories were reviewed by 8 occupational therapists, a librarian, 1st grade teacher, and revised based on additional feedback from 4 parents and students during pre-pilot testing phase.
IRO Part 2: Who does the child read with?

- 12 categories of people the child read with based on pre-pilot testing of the tool.
- Social context of reading.

IRO Part 3: Goal-Setting

PART 3: What reading materials do you want to master?

This section asks the priorities of the student about reading.
From the categories listed in Part 1, identify the TOP 3 reading materials or sources of reading that the child WANTS to read and WANTS to read VERY WELL.

Implication to OT for Reading Assessment and Intervention

- Tells us the materials we can use for therapy.
- Tells us student perceptions about reading.
- Informs us of supports available.
- Identifies contexts of reading performance.
Do you want to help with the development of the IRO?

- Sign up sheet!
- Receive a validation copy of the assessment tool.
- Need to administer the tool in the Fall to 1 or more K-3 children with or without reading difficulties.
- Return the de-identified test forms via mail.

When does OT help with children who struggle to read?

- Avoidance, dislike, decreased initiation and participation of reading.
- Impacts successful participation in education at school.

Entry-Point of Intervention

- Through the psychosocial system.
- Providing opportunities for success and feelings of competence in the student role.
## How do we do OT for Reading?

I. Occupational Readiness Training
II. Introducing chunks of reading and writing
III. Strategy Development
IV. Strategy applications with increasing amounts of reading and writing
V. Participation in highly-structured reading and writing tasks

### I. Occupational Readiness

- Performance components
  - Visual Processing, Visual Motor, Sensory Processing, Executive Functions
  - Handwriting

### II. Chunks of Reading and Writing

- Embedded in preferred tasks
- Coupling of less-preferred with much-preferred tasks
- Clues in treasure hunt game
- *Word*/phrase station in obstacle course tasks
- Read a key ingredient in a recipe during cooking
- Fish for words while on a swing
III. Strategy Development

- Cognitive Orientation to Daily Occupations approach (Polatajko & Mandich, 2004).
- Self-initiated, individualized strategies based on sources of performance breakdown.
  - Where is the source of performance breakdown?
  - What does the child need to be able to do?
  - How can the child do it?
  - How can I enable the child to do it?

Strategy Development
ADD A

ASK

Don’t Tell Me! What to DO!!

Strategy Menu

- “Silly pointy fingers”
- “Walking fingers”
- “Skip, skip, skip”
- “Whisper, whisper”
- “Mark the spot”
- “Covering / Cut the Words / Spread out the words”
- “Sound it out”
- “Mark the word.”
- “Review the word / Write the word”
- “Spell the word in my head 5 times.”
Sample Strategies: Handwriting

- My Writing Guide
  - I write my letters from top to bottom.
  - My letters are big and bold.
  - My letters do not touch each other.
  - I leave a little space between my words.
  - I lift my pencil properly.

- Let's Check Your Work!
  - I finish my work with good speed.
  - My work is clean and organized.
  - I hold my pencil properly.
  - I was patient and worked hard even if this task was challenging.
  - I am proud and happy with my work.

Sample Strategies: Reading

- Checklist when Reading Text
  - I use my finger to point at the letters and words I am reading.
  - I move my finger through letters of a word to help me remember.
  - I move my finger across a word helps me read a word.
  - I trace the start of the line to help me keep my spot.

Sample Strategies for Reading

- Trace the letters and words.
- Color the squares red in the picture that begins with the sound.
- Color the other squares blue.
Participation in highly-structured tasks

- As self-mastery and competence increases, increase the amount of structure to tasks.
- The goal is to simulate actual reading tasks in various forms.
- Create self-monitoring aids: level of anxiety, time logs, variety

Signs of Increasing Adaptiveness

- Child recognizes mistakes.
- Child remembers strategies.
- Child creates additional strategies.
- Child begins self-correction.

Putting It All Together
Concepts to Ponder

- Literacy can be addressed as a skill and as an occupation.
- Occupational therapy has much to offer at the level of occupation.
- There are a number of ways educators assess and teach reading as a skill. It is important to understand these as OTs goal is to support these efforts.
- OT can provide assessment at the level of the occupation.
- OT can provide intervention at the level of the occupation.
  - Occupational analysis of the task of reading/writing.
  - Intervention directed toward the goal of participation and engagement in the occupation of reading.
  - Collaborative member in Universal Design for Learning

Writing Goals for Literacy: Colorado Academic Standards

- Reading, Writing, and Communicating
  - Reading for All Purposes
    - Grade Level Expectations
    - Evidence Outcomes
    - 21st Century Skills and Readiness Competencies

IEP Goals Related to the Common Core for OT/PT

- Print Concepts
  - CCSS.ELA-Literacy.RF.1.1
    Demonstrate understanding of the organization and basic features of print.
  - CCSS.ELA-Literacy.RF.1.1a
    Recognize the distinguishing features of a sentence.
IEP Goals Related to the Common Core for OT/PT

- Student will move eyes and head to visually focus on ELA materials in horizontal, vertical and diagonal planes ___% of the time.
- Student will maintain visual attention on the teacher or other visuals ___% of the time.
- Student will be able to break words into syllables by rhythmically clapping to represent at least two syllables in a word ___% of the time.

Think Beyond!!!

- Share stories from your caseload. How can you apply the information presented today?
- Look through the Reading Standards.
  ◦ Circle objectives that speak to occupational therapy intervention
  ◦ Try out a goal...how can occupational therapists write to the standards?
- Turn in your handout sheet! We need to learn from you!

Q&A

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Thank You!